

RESEARCH NOTE 84-15

MAINTENANCE PERFORMANCE SYSTEM (ORGANIZATIONAL)
ORGANIZATIONAL MAINTENANCE TASKS SELECTED FOR
THE ENHANCED INFORMATION AND EVALUATION SYSTEM

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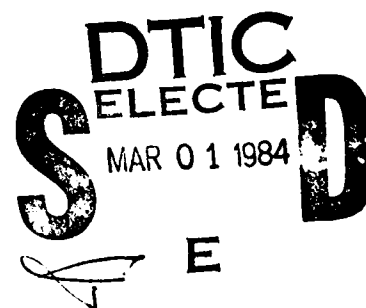
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Maintenance Performance System-Organizational (MPS-0) is being developed to measure maintenance performance, diagnose performance problems, take corrective actions, and provide training. The Information and Evaluation System (I&ES) is one component of MPS-0. It provides data on maintenance effectiveness, technical proficiency, and application of resources. The I&ES provides a method for collecting, storing, and processing data and providing output in the form of reports. This document summarizes the process that was used to define and verify maintenance tasks for the Military Occupational Specialties (MOS's), vehicles		

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and equipment to be covered in the I&ES. It provides listings of all tasks and the related performance steps for each of the MOS's and related equipment.

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INTRODUCTION

A Maintenance Performance System (Organizational) (MPS(O)) is being developed to help Army maintenance leaders and managers improve and sustain maintenance effectiveness at the highest levels possible under operational constraints. When development of the MPS(O) is complete, it will be an integrated system for measuring performance, diagnosing problems, prescribing training, and providing a basis for taking other corrective actions.

The Information and Evaluation System (I&ES) is one component of the overall Maintenance Performance System (Organizational) (MPS(O)). It provides unique data on maintenance effectiveness, technical proficiency, and application of resources. The I&ES provides a method for collecting, storing, and processing data and providing output in the form of reports. These reports contain information on performance during the current, or most recent, reporting period and relate it to performance during prior reporting periods. Data from prior reporting periods are also averaged to serve as a comparative yardstick when judging current performance.

I&ES reports are distributed to commanders, maintenance managers, supervisors, and trainers. They can use these reports to review maintenance performance, identify problems, and take corrective action in order to improve maintenance performance. One special task performance report is provided to individual mechanics and drivers/crewmen to help them keep track of their own skill development.

PURPOSE OF THIS REPORT

The purposes of this report are to:

- Provide background on MOS/equipment selection for the final I&ES.
- Summarize the task analysis process.
- Provide listings of maintenance tasks for each vehicle/equipment and MOS to be covered in the final I&ES.

- Identify the related performance steps for each task.
- Note the relationships of soldier's manual tasks to I&ES-selected tasks.
- Provide a reference document for changes to other I&ES components.

INITIAL I&ES COVERAGE

The preliminary I&ES covered selected equipment and personnel in an armor battalion. To test and evaluate system operation, initial implementation of I&ES was limited to 'A' Company, Combat Support Company, and the battalion maintenance platoon of a tank battalion. Equipment and MOS's covered in this preliminary phase were the tracked vehicles, their crews, and the maintenance personnel in these units.

Specific equipment covered in the initial I&ES was:

- Tank, M60A1
- Carrier Family, M113A1 including:
 - M106A1, 107mm Mortar Carrier
 - M125A1, 81mm Mortar Carrier
 - M577A1, Command Post Carrier
 - M901, Improved TOW Vehicle

Specific MOSs covered in the initial I&ES were:

- 11C Mortarman
- 19D Cavalry Scout
- 19E Armor Crewman
- 19F Tank Driver (subsequently combined with Armor Crewman MOS, 19F designator is discontinued)
- 45N M60A1/A3 Turret Mechanic
- 63N M60A1/A3 Tank System Mechanic
- 63T FV System Mechanic

I&ES EXPANSION

The objective of the 2nd-year effort is to expand I&ES coverage to include additional MOS and equipment beyond the initial seven MOS and two vehicle types. Coverage is also to be extended to include all other companies within the tank battalion.

Expansion Findings

The candidate options for coverage in an expanded I&ES were studied, using such criteria as equipment density, mission criticality, maintenance requirements, and numbers of personnel in an MOS. The results were used to guide development of the final MOS. Summary findings from the study are presented below.

- MOS 12F (Engineer Tracked Vehicle Crewman (AVLB)) will be added to I&ES by modification of the MOS 19E/F task list for the M60A1, i.e., by deleting armament tasks and adding those tasks specific to the launcher system.
- MOS 31V (Tactical Communication System Mechanic) has significant maintenance tasks, and will be added to I&ES coverage.
- MOS 63B (Light Wheeled Vehicle and Power Generator Mechanic) has significant maintenance tasks, and will be added to I&ES coverage.
- MOS 63S (Heavy Wheeled Vehicle Mechanic) has significant maintenance tasks, and will be added to I&ES coverage.
- M113 (family) APC operators in MOS 11C and 19D are currently covered in I&ES. For consistency, M113 (family) APC operators in other MOSs, e.g., 19E, 36K, 63N, and 91B, will be added to I&ES coverage. This requires only modification of report headings and revision of procedures.
- Personnel with various primary duty assignments, such as clerks, cooks, and aidmen, are frequently assigned a secondary duty as operators of wheeled vehicles and FM radios. These operators are authorized to perform only preventive maintenance checks and services (PMCS). The operators (and their vehicles) are dispersed throughout the battalion, in low density within any given platoon or company. Each wheeled vehicle has an assigned operator, but other persons use the vehicle when the assigned operator is not available. The operator's supervisor has a primary duty other than maintenance, e.g., as mess sergeant, PAC NCOIC, or supply sergeant, and is seldom in the motor pool checking maintenance performance. As a result, I&ES form completion on a consistent basis by operators may be unattainable. The efficacy of operator PMCS may be reflected in the amount of corrective maintenance performed by mechanics. It is thus not cost-effective to add operators of wheeled vehicles and I&ES at this time.
- All maintenance on recovery vehicles, M88 and M578, is performed by mechanics MOS 63N or 63T. Since we want to account for as much of the mechanics' work as possible, maintenance tasks for these vehicles will be added to I&ES coverage.

- Automotive mechanics, MOS 63B, 63N, 63S, and 63T, spend significant portions of their time maintaining wheeled vehicles. Wheeled vehicles will therefore be added to I&ES coverage.
- Comm. systems mechanics, MOS 31V, repair associated radio components, such as CVC helmets and control boxes, and wire communication equipment in addition to repairing radios. These items will be included in I&ES.
- Power generators and small arms, i.e., rifles, pistols, and submachine guns, do not have significant maintenance requirements and are not mission critical. These equipments will not be included in I&ES.

Expansion Coverage

The findings on expansion options summarized above were reviewed for the COTR in Santa Barbara, California, on May 11, 1982. Subsequently, the COTR and Anacapa project staff defined the equipment and MOS to be covered in an expanded I&ES. A summary list of the equipment and MOS's in the final system is presented in Table 1.

TABLE 1
EQUIPMENT & MOS IN FINAL I&ES

Equipment	Operator/Crew			MOS			
	11C/19D	12F	19E	31V	45N	63B/S	63N/T
AVLB, M60A1L		x					x
Carrier Family, M113A1	x						x
Radios and Associated Communications Equipment				x			
Recovery Vehicle, M88							x ¹
Recovery Vehicle, M578							x ¹
Tank, M60A1			x		x		x
Truck, 1/2-ton, M151						x	x
Truck, 1 1/2-ton, M561/792						x	x
Truck, 2 1/2-ton, M35/54						x	x
Truck, 8/10-ton, M520/553/559						x	

¹This mechanic MOS also serves as operators/crews

I&ES is presently implemented in 'A' Company, Combat Support Company, and the battalion maintenance platoon of an armor battalion. The final I&ES will cover these companies:

- HH Company
- CS Company
- A Company
- B Company
- C Company
- Bn Motor Pool

Thus all maintenance activities in the battalion are covered.

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TASK LIST DEVELOPMENT

This section describes the process that was used to develop maintenance task lists for those vehicles, equipment, and MOS's covered in the final I&ES. It followed the sequence: preparing a preliminary task list, verification of the selected task lists in the field, definition of a final task list, development of performance steps, and final review.

PREPARATION OF PRELIMINARY TASK LISTS

Preliminary maintenance task lists were prepared for each MOS by vehicle or equipment type, using three initial sources of information. They were:

- Critical task lists
- Soldier's Manuals
- I&ES data base

The **critical task lists** prepared by TRADOC proponents for each MOS were examined to identify critical maintenance tasks for those vehicles/equipment in an armor battalion's inventory.

Tasks described in the **Soldier's Manual** were reviewed to identify those tasks considered by the proponent to be critical to mission performance and career advancement. This review also provided information on the performance steps used to accomplish each task.

The **I&ES data base** was examined to identify number of performances of each selected task related to vehicles and MOS's. Several tasks were noted that were performed very infrequently or not at all. In addition, there was a high incidence of performance for "Other" tasks, i.e., ones not listed in the 1st year I&ES.

¹ Harper, W.R., and Rugge, S.M. **Maintenance Performance Systems (Organizational). Operator and Organizational Maintenance Tasks Selected for the Information and Evaluation System.** Santa Barbara, California: Anacapa Sciences, Inc., Technical Report 465-7, June 1981.

INITIAL FIELD VERIFICATION OF SELECTED TASK LISTS

The preliminary task lists were submitted to subject-matter experts (SME) for verification. Maintenance managers, technicians, and personnel working in each MOS were asked to review the lists. Respondents were asked to report frequency of performance for each task on the preliminary lists and to identify any other tasks frequently performed which were not listed.

TASK LIST DEFINITION

The preliminary task lists were revised based on results of the field verification by the SME's, review of initial source information cross-referenced to appropriate technical manuals. Since I&ES is designed to respond to unit needs, field input and I&ES task performance frequency data from the specific armor battalion assigned as our "test" unit weighted task selection. Tasks were retained on, or added to, the preliminary list if they were performed at least once a month. Soldier's Manual tasks were included whenever they matched the unit equipment/MOS criteria. Previous analyses of task data on other maintenance projects has shown that Soldier's Manual task lists apply to the entire Army, therefore some of those tasks may not apply in a given unit. For example, a task in the Soldier's Manual for a mechanic MOS may not be done in a unit because the unit does not have the equipment, the fault never occurs or, if it does occur, the task is performed by another MOS, e.g., direct support personnel or operators/crews. (A separate discussion of the relationship between SM tasks and I&ES tasks is contained in Appendix A.)

Analysis of field data and source information revealed no difference in the tasks (by MOS's and equipment), for preventive maintenance checks and services (PMCS) done by operators/crews, and scheduled preventive maintenance (PM) services done by mechanics. As a result, task lists for PMCS and PM services are the same for each MOS and equipment items. Corrective maintenance tasks are, of course, MOS-specific by vehicle/equipment.

DEVELOPMENT OF PERFORMANCE STEPS

An important part of task list development was to clearly and unequivocally define what was included in performance of a task. For each task on the revised lists, performance steps were developed to identify what **was** and what **was not**

included in performing that task. These performance steps summarized the extent of each task, and were similar to those in the Soldier's Manuals. More detailed descriptions of task performance were obtained from the Technical Manuals (TM) for each type equipment where necessary.

FINAL REVIEW OF TASK LISTS

The revised task lists and related performance steps were submitted to subject matter experts in the field for final verification. Minor changes and corrections to task and performance step listings were made as a result of these reviews. The tasks selected are listed in Appendix B. The performance steps related to each task are listed in Appendix C.

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APPENDIX A

**MATCHES BETWEEN SOLDIERS MANUALS AND
I&ES TASKS FOR MECHANIC I&ES**

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Skill level 1 and 2 (SL1/2) duty position tasks in Soldier's Manuals for MOS's covered in I&ES were examined to test the feasibility of their inclusion in I&ES task lists. Skill level 3 and 4 tasks were not examined, since tasks for these levels are primarily supervisory/management tasks not related to direct performance of maintenance work.

The Soldier's Manual tasks for operator/crew MOS 11C, 12F, 19D and 19E relate mostly to combat skills. Only a few relate to maintenance performance. For example, of the 104 tasks for MOS 19E (SL1/2) only two apply to corrective maintenance tasks on a tank. Obviously, there cannot be any significant match between Soldier's Manual and I&ES tasks for this MOS.

Most duty position tasks for mechanics are maintenance-specific. For MOS 45N, 63B, 63N, and 63T, the number of matches between Soldier's Manual tasks (SL1/2) and I&ES tasks is shown in Table A-1 below.

The lowest number of matches is for MOS 45N, where 29 of the 60 tasks in the Soldier's Manual (i.e., 42%) are on the Combat Engineer Vehicle (M728) which is not currently available in the test battalion. Another 18 tasks (i.e., 26%) are not done by MOS 45N, but by operators/crews or the unit armorer in the test battalion. Examples of these tasks are:

- Replace evacuator chamber
- Repair breech operating mechanism
- Repair breech block group (in 19E Soldier's Manual)
- Inspect machinegun, M240
- Repair machinegun, M85, back plate group
- Repair machinegun, M240, trigger and frame assembly

Troubleshooting tasks in a Soldier's Manual were counted as matches for I&ES tasks, since I&ES corrective maintenance tasks include fault diagnosis/verification procedures as the initial step in task performance. Preventive maintenance and recovery service tasks were not counted as a match, since they are not corrective maintenance.

Examples of service tasks are: operate front or rear winch on a wrecker or perform a lifting or towing operation. The category of work not done in the test

battalion includes both tasks not performed because the fault has never occurred in the unit, and work done outside the unit, e.g., by support maintenance personnel.

We also did **not** include; tasks which had never been performed in the test unit, tasks that were typically done by support personnel from outside the unit, and tasks on equipment not issued to, or even possessed by, the unit.

TABLE A-1
CORRELATION OF SOLDIER'S MANUAL AND I&ES TASKS

MOS	REASONS FOR NON-MATCH						
	Total Tasks in SM (SL 1/2)	SM Tasks that Match with I&ES Tasks	Correla- tion %	Vehicle Not Included in I&ES	Work Not Done in Test Bn	Recovery Task	Service Task
45N	69	16	22	29 ¹	5		2
63B	126	97	77	6 ²	18	4	1
63N	74	57	77		2	9	2
63T	71	62	90		2	6	1
TOTAL	340	232	68	35	27	19	6
							21

¹ Vehicle not in test battalion (Combat Engineer Vehicle, M728).

² Vehicle not in test battalion (5-ton truck, M809).

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APPENDIX B

TASK LISTS

A listing has been developed of all preventive maintenance tasks, and MOS-specific corrective maintenance tasks by vehicle/equipment. The preventive maintenance task list applies to all preventive maintenance tasks performed by any MOS on the equipment covered in I&ES. The corrective maintenance task lists include all corrective maintenance tasks performed in an armor battalion on a given vehicle or equipment type.

For example, MOS 63N and 63T both perform automotive mechanic corrective maintenance tasks on the M113A1 APC (family). Thus the corrective maintenance task list for the M113A1 applies to both MOS's.

If corrective maintenance tasks can be legitimately assigned to different MOS's, a single task list was compiled covering both MOS's.

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TASK LIST
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
(-10 LEVEL)

1. PERFORM OPERATOR/CREW PMCS (-10 TM)
2. ASSIST ON PERIODIC SERVICE (Q, S, OR A)
3. SERVICE AIR CLEANERS OR FILTERS
4. SERVICE WINCH OR HOIST AND/OR CABLES
5. SERVICE GAS PARTICULATE FILTER UNIT
6. CLEAN/SERVICE 105 MM GUN
7. CLEAN/SERVICE 7.62 MM MACHINEGUN
8. CLEAN/SERVICE .50 CAL MACHINEGUN
9. CLEAN/SERVICE 107 MM MORTAR
10. CLEAN/SERVICE TOW SYSTEM
11. PERFORM OIL SAMPLING (AOAP)
12. OTHER

TASK LIST
PREVENTIVE MAINTENANCE SERVICES
(-20 LEVEL)

1. PERFORM 'Q' SERVICE
2. PERFORM 'S' SERVICE
3. PERFORM 'A' SERVICE
4. PERFORM 'L' SERVICE
5. OTHER

**OPERATOR/CREW
MOS 11C, 19D, OTHER
CORRECTIVE MAINTENANCE TASK LIST
CARRIER FAMILY, M113A1
(Includes M106A1, M125A1, M577A1, M901A1)**

1. REPLACE TRACK SHOES (PADS)
2. REPLACE TRACK ASSEMBLY OR TRACK BLOCK
3. ADJUST TRACK TENSION
4. REPLACE ROADWHEEL
5. REPLACE IDLER ARM AND SPINDLE
6. REPLACE AIR CLEANER
7. REPLACE FUEL FILTER
8. REPLACE FUEL GAGE
9. REPLACE OIL FILTER
10. ADJUST LATERALS (STEERING CONTROL)
11. REMOVE OR INSTALL PERISCOPE, M17
12. REMOVE OR INSTALL PERISCOPE, M19 (IR)
13. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
14. OTHER

**OPERATOR/CREW, MOS 12F
CORRECTIVE MAINTENANCE TASK LIST
AVLB (M60A1L)**

1. REPLACE TRACK ASSEMBLY OR TRACK BLOCK
2. REPLACE TRACK PADS
3. REPLACE END CONNECTORS AND/OR CENTER GUIDES
4. ADJUST TRACK TENSION
5. REPLACE ROAD WHEEL
6. REPLACE ROAD WHEEL/SUPPORT ROLLER BEARINGS AND SEALS
7. REPLACE ROAD WHEEL ARM
8. REPLACE SUPPORT ROLLER
9. REPLACE TORSION BAR
10. REPLACE SHOCK ABSORBERS
11. REPLACE COMPENSATING IDLER WHEEL HUB AND ARM
12. REPLACE COMPENSATING IDLER ASSEMBLY
13. REPLACE DRIVE SPROCKET
14. REMOVE BACK DECK
15. INSTALL BACK DECK
16. REMOVE DEFECTIVE/INOPERABLE POWERPACK
17. INSTALL REPAIRED POWERPACK
18. REMOVE POWERPACK TO DO OTHER TASK(S)
19. INSTALL POWERPACK AFTER COMPLETING OTHER TASK(S)
20. REPLACE FINAL DRIVE
21. REPLACE FINAL DRIVE SEALS
22. REPLACE FUEL FILTER
23. REPLACE OIL FILTER
24. REPLACE AIR CLEANER FILTER
25. REPLACE BATTERIES, CABLES AND/OR CLAMPS
26. REMOVE OR INSTALL DRIVER'S PERISCOPE, M24 (IR)
27. REMOVE OR INSTALL DRIVER'S PERISCOPE, M27
28. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
29. OTHER

**OPERATOR/CREW, MOS 19E
CORRECTIVE MAINTENANCE TASK LIST
TANK M60A1**

1. REPLACE TRACK ASSEMBLY OR TRACK BLOCK
2. REPLACE TRACK PADS
3. REPLACE END CONNECTORS AND/OR CENTER GUIDES
4. ADJUST TRACK TENSION
5. REPLACE ROAD WHEEL
6. REPLACE ROAD WHEEL/SUPPORT ROLLER BEARINGS AND SEALS
7. REPLACE ROAD WHEEL ARM
8. REPLACE SUPPORT ROLLER
9. REPLACE TORSION BAR
10. REPLACE SHOCK ABSORBERS
11. REPLACE COMPENSATING IDLER WHEEL HUB AND ARM
12. REPLACE COMPENSATING IDLER ASSEMBLY
13. REPLACE DRIVE SPROCKET
14. REMOVE BACK DECK
15. INSTALL BACK DECK
16. REMOVE DEFECTIVE/INOPERABLE POWERPACK
17. INSTALL REPAIRED POWERPACK
18. REMOVE POWERPACK TO DO OTHER TASK(S)
19. INSTALL POWERPACK AFTER COMPLETING OTHER TASK(S)
20. REPLACE FINAL DRIVE
21. REPLACE FINAL DRIVE SEALS
22. REPLACE FUEL FILTER
23. REPLACE OIL FILTER
24. REPLACE AIR CLEANER FILTER
25. REPLACE BATTERIES, CABLES AND/OR CLAMPS
26. REMOVE OR INSTALL DRIVER'S PERISCOPE, M24 (IR)
27. REMOVE OR INSTALL DRIVER'S PERISCOPE, M27
28. REMOVE OR INSTALL LOADER'S PERISCOPE, M37
29. REMOVE OR INSTALL TC/GUNNER'S PERISCOPE, M32/36 (IR)
30. REPAIR BREECH BLOCK
31. REPAIR BREECH OPERATING MECHANISM
32. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
33. OTHER

**TURRET MECHANIC, MOS 45N
CORRECTIVE MAINTENANCE TASK LIST
TANK M60A1**

1. REPLACE SLIP RING INTERFERENCE SWITCH
2. REPLACE NO-BAK
3. REPLACE BACK DECK CLEARANCE VALVE
4. REPAIR MAIN GUN FIRING CIRCUIT
5. REPLACE STABILIZATION SYSTEM CONTROL BOX
6. REPLACE STABILIZATION SYSTEM COMPONENTS
7. ADJUST STABILIZATION SYSTEM
8. REPLACE SUPERELEVATION ACTUATOR
9. REPLACE SUPERELEVATION ACTUATOR CABLE
10. REPLACE ELEVATION SYSTEM
11. BLEED TURRET HYDRAULIC SYSTEM
12. REPLACE MANUAL ELEVATION PUMP
13. CHARGE MANUAL ELEVATION SYSTEM
14. REPLACE ANTI-BACKLASH CYLINDER
15. ADJUST BACKLASH
16. REPLACE MAIN ACCUMULATOR
17. REPLACE ACCUMULATOR PRESSURE GAGE
18. CHARGE MAIN ACCUMULATOR
19. REPLACE TC'S HANDLE
20. REPAIR GUNNER'S HANDLE PALM SWITCHES
21. REPAIR TC'S HANDLE PALM SWITCHES
22. REPLACE GUNNER'S CONTROL BOX
23. REPLACE/ADJUST LOADER'S SAFETY SWITCH
24. REPLACE SOLENOID VALVE
25. PERFORM SYNCHRONIZATION CHECK - RAMP METHOD
26. PERFORM SYNCHRONIZATION CHECK - INDOOR METHOD
27. REPLACE AZIMUTH INDICATOR
28. REPLACE M13A2/M13A1D BALLISTIC COMPUTER
29. REPLACE RANGEFINDER AND/OR END HOUSING
30. PURGE AND CHARGE SIGHTS
31. REPLACE M32/M36 LIGHT CONTROL SOURCE (INFINITY SIGHT)
32. REPLACE TURRET POWER DISTRIBUTION BOX
33. ADJUST CUPOLA CRADLE ASSEMBLY
34. REPLACE/REPAIR CRADLE JACK SCREW ASSEMBLY
35. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
36. OTHER

AUTOMOTIVE MECHANIC, MOS 63N/T
CORRECTIVE MAINTENANCE TASK LIST
CARRIER FAMILY, M113A1
(Includes M106A1, M125A1, M577A1, M901)

1. REMOVE DEFECTIVE/INOPERATIVE POWER PLANT
2. INSTALL REPAIRED POWER PLANT
3. REMOVE POWER PLANT TO DO OTHER TASK(S)
4. INSTALL POWER PLANT AFTER COMPLETING OTHER TASK(S)
5. REPLACE FUEL FILTERS
6. REPLACE FUEL PUMP
7. REPLACE FUEL PRESSURE SENDING UNIT
8. REPLACE FUEL TANK
9. REPLACE FUEL SHUTOFF CONTROL
10. REPLACE HAND THROTTLE CONTROL
11. REPLACE COOLING FAN TOWER
12. REPLACE RADIATOR
13. REPLACE RADIATOR HOSE
14. REPLACE COOLANT PUMP
15. REPLACE STARTER
16. REPLACE STARTER SOLENOID
17. REPLACE GENERATOR
18. REPLACE BELTS AND/OR PULLEYS
19. ADJUST BELTS
20. TROUBLESHOOT ELECTRICAL SYSTEMS
21. REPAIR WIRING
22. REPLACE SENDING UNITS OR GAGES
23. REPLACE BATTERIES, CABLES, AND/OR CLAMPS
24. REPLACE VOLTAGE REGULATOR
25. ADJUST VOLTAGE REGULATOR
26. ADJUST TRANSMISSION LINKAGE
27. REPLACE TRANSMISSION CROSS SHAFT
28. REPLACE OIL FILTERS
29. REPLACE OIL COOLER
30. REPLACE OIL COOLER HOSE AND FITTINGS
31. REPLACE FINAL DRIVE
32. ADJUST LATERALS (STEERING CONTROL)
33. REPLACE PIVOT STEER ASSEMBLY
34. ADJUST STEERING BRAKE BAND
35. REPLACE FIXED FIRE EXTINGUISHERS
36. REPLACE ROAD WHEEL ARM AND HUB
37. REPLACE ROAD WHEEL BEARINGS
38. REPLACE IDLER WHEEL ARM AND SPINDLE
39. REPLACE U-JOINT
40. REPLACE EXHAUST GASKETS OR OTHER EXHAUST COMPONENTS
41. REPLACE PERSONNEL HEATER
42. REPLACE BILGE PUMP
43. REPLACE WATERTIGHT SEALS
44. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
46. OTHER

AUTOMOTIVE MECHANIC, MOS 63N
CORRECTIVE MAINTENANCE TASK LIST
TANK M60A1
(Includes AVLB, M60A1L)

1. REMOVE DEFECTIVE/INOPERATIVE POWERPACK
2. GROUND HOP POWERPACK
3. INSTALL REPAIRED POWERPACK
4. REMOVE POWERPACK TO DO OTHER TASK(S)
5. INSTALL POWERPACK AFTER COMPLETING OTHER TASK(S)
6. REMOVE BACK DECK
7. INSTALL BACK DECK
8. REPLACE FUEL LINES AND/OR FITTINGS
9. REPLACE FUEL FILTERS
10. REPLACE OIL COOLER
11. REPLACE OIL FILTERS
12. REPLACE OIL COOLER LINES
13. ADJUST ACCELERATOR, THROTTLE CONTROLS, AND LINKAGE
14. REPLACE ACCELERATOR, THROTTLE CONTROLS, AND/OR LINKAGE
15. TROUBLESHOOT ELECTRICAL SYSTEM
16. REPAIR WIRING
17. REPLACE SENDING UNITS OR GAGES
18. REPLACE CIRCUIT BREAKERS
19. REPLACE BATTERIES, CABLES, AND/OR CLAMPS
20. REPLACE VOLTAGE REGULATOR
21. REPLACE STARTER
22. REPLACE GENERATOR AND/OR SEAL
23. REPLACE AIR CLEANER BLOWER MOTOR
24. REPLACE BLOWER MOTOR RELAY
25. REPLACE FAN TOWER SEAL
26. ADJUST TRANSMISSION LINKAGE
27. REPLACE TRANSMISSION SHIFTING CONTROL ASSEMBLY
28. REPLACE FINAL DRIVE
29. REPLACE FINAL DRIVE SEALS
30. REPLACE MASTER OR SLAVE CYLINDER
31. REPLACE MAIN BRAKE LINE
32. BLEED BRAKE LINES
33. ADJUST BRAKES, CONTROLS, AND/OR LINKAGE
34. REPLACE PARKING BRAKE CABLE
35. ADJUST SERVO BANDS
36. ADJUST STEERING CONTROLS AND LINKAGE
37. REPLACE FIXED FIRE EXTINGUISHERS
38. ADJUST/RESET FIXED FIRE EXTINGUISHER CONTROL VALVES
39. REPLACE ROAD WHEEL BEARINGS AND SEALS
40. REPLACE SUPPORT ROLLER BEARINGS AND SEALS
41. REPLACE SHOCK ABSORBER
42. REPLACE SHOCK ABSORBER BUSHINGS
43. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
44. OTHER

**CREW AND MECHANIC, MOS 63N
CORRECTIVE MAINTENANCE TASK LIST
RECOVERY VEHICLE, M88A1**

1. REMOVE DEFECTIVE/INOPERATIVE POWER PLANT
2. GROUND HOP POWER PLANT
3. INSTALL REPAIRED POWER PLANT
4. REMOVE POWER PLANT TO DO OTHER TASK(S)
5. INSTALL POWER PLANT AFTER COMPLETING OTHER TASK(S)
6. REMOVE BACK DECK
7. INSTALL BACK DECK
8. REPLACE OR REPAIR FRONT MOTOR MOUNT ASSEMBLY
9. REPLACE FUEL LINES AND/OR FITTINGS
10. REPLACE FUEL FILTERS
11. REPAIR FUEL SHUTOFF CONTROL VALVE
12. ADJUST ACCELERATOR, THROTTLE CONTROLS AND LINKAGE
13. REPLACE ACCELERATOR, THROTTLE CONTROLS AND/OR LINKAGE
14. REPLACE OIL COOLER
15. REPLACE OIL FILTERS
16. REPLACE OIL LINES
17. TROUBLESHOOT ELECTRICAL SYSTEM
18. REPAIR WIRING
19. REPLACE SENDING UNITS OR GAGES
20. REPLACE CIRCUIT BREAKERS
21. REPLACE BATTERIES, CABLES AND/OR CLAMPS
22. REPLACE RPM (SPEED CONTROL) SOLENOID
23. REPLACE VOLTAGE REGULATOR
24. REPLACE MAIN ENGINE STARTER
25. REPLACE STARTER RELAY AND HOUSING ASSEMBLY
26. REPLACE MAIN ENGINE GENERATOR
27. REPLACE APU ASSEMBLY
28. REPLACE APU GENERATOR STARTER
29. REPLACE APU FUEL PUMP AND/OR FILTER
30. ADJUST TRANSMISSION LINKAGE
31. REPLACE TRANSMISSION SHIFTING CONTROL ASSEMBLY
32. REPLACE OR REPAIR HYDRAULIC LINES AND FITTINGS
33. REPLACE FINAL DRIVE
34. REPLACE FINAL DRIVE SEALS (O RINGS)
35. ADJUST BRAKES, CONTROLS AND/OR LINKAGE
36. ADJUST STEERING CONTROLS AND LINKAGE
37. REPLACE FIXED FIRE EXTINGUISHERS
38. ADJUST/RESET FIXED FIRE EXTINGUISHER HEADS
39. REPLACE TRACK ADJUSTING ARM
40. ADJUST TRACK TENSION
41. REPLACE TRACK ASSEMBLY OR TRACK BLOCK
42. REPLACE END CONNECTORS AND/OR CENTER GUIDES
43. REPLACE ROAD WHEEL OR BEARINGS AND SEALS
44. REPLACE ROAD WHEEL ARM
45. REPLACE SUPPORT ROLLER OR BEARINGS AND SEALS
46. REPLACE SHOCK ABSORBERS AND/OR BUSHINGS
47. REPLACE DRIVE SPROCKET
48. REPLACE OR REPAIR HOIST CABLES
49. REPLACE OR REPAIR WINCH CABLES
50. REPLACE SPADE RELEASE CABLE
51. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
52. OTHER

**CREW AND MECHANIC, MOS 63T
CORRECTIVE MAINTENANCE TASK LIST
RECOVERY VEHICLE, M578**

1. REMOVE DEFECTIVE/INOPERATIVE POWER PLANT
2. INSTALL REPAIRED POWER PLANT
3. REMOVE POWER PLANT TO DO OTHER TASK(S)
4. INSTALL POWER PLANT AFTER COMPLETING OTHER TASK(S)
5. REPLACE AIR CLEANER BLOWER ASSEMBLY
6. REPLACE FUEL FILTERS
7. REPLACE FUEL LOW PRESSURE LINES AND/OR FITTINGS
8. REPLACE OIL FILTERS
9. REPLACE RADIATOR
10. REPLACE WATER HOSES AND PIPES
11. REPLACE FAN
12. REPLACE FAN BELTS
13. TROUBLESHOOT ELECTRICAL SYSTEM
14. REPAIR WIRING
15. REPLACE SENDING UNITS OR GAGES
16. REPLACE BATTERIES, CABLES, AND/OR CLAMPS
17. REPLACE VOLTAGE REGULATOR
18. REPLACE GENERATOR
19. REPLACE FINAL DRIVE
20. ADJUST SHIFTING CONTROLS AND LINKAGE
21. ADJUST MECHANICAL BRAKE CONTROLS AND LINKAGE
22. REPLACE FIXED FIRE EXTINGUISHERS
23. REPLACE ROAD WHEEL ARM AND HUB
24. REPLACE ROAD WHEEL
25. REPLACE IDLER ARM AND HUB
26. REPLACE DRIVE SPROCKET HUB
27. ADJUST TRACK TENSION
28. REPLACE TRACK ASSEMBLY
29. REPLACE TRACK SHOES (PADS)
30. ADJUST STEERING CONTROL AND LINKAGE
31. REPLACE LOCKOUT CYLINDER ASSEMBLY
32. REPLACE BOOM CABLE
33. REPLACE BOOM HYDRAULIC CYLINDER
34. REPLACE HYDRAULIC LINES AND FITTINGS
35. REPLACE PERSONNEL HEATER ASSEMBLY
36. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
37. OTHER

**AUTOMOTIVE MECHANIC
MOS 63B/S AND 63N/T
CORRECTIVE MAINTENANCE TASK LIST
TRUCK, UTILITY M151**

1. ADJUST VALVES
2. ADJUST CLUTCH PEDAL FREE TRAVEL
3. REPLACE CLUTCH, PRESSURE PLATE AND THROWOUT BEARING
4. REPLACE CARBURETOR
5. REPLACE FUEL LINES AND VENT TUBES
6. REPLACE FUEL FILTERS
7. REPLACE FUEL PUMP
8. REPLACE FUEL TANK
9. REPLACE EXHAUST GASKETS
10. REPLACE MUFFLER AND/OR TAIL PIPE
11. REPLACE RADIATOR
12. REPLACE COOLANT HOSES AND CLAMPS
13. REPLACE BELTS AND/OR PULLEYS
14. ADJUST BELTS
15. REPLACE GENERATOR
16. REPLACE STARTER
17. REPLACE IGNITION DISTRIBUTOR
18. REPLACE CAPACITOR, ROTOR CONTACT POINTS AND/OR SPARK PLUGS
19. ADJUST CONTACT POINTS
20. ADJUST IGNITION TIMING
21. REPAIR WIRING
22. REPLACE BATTERIES, CABLES AND/OR CLAMPS
23. REPLACE CIRCUIT BREAKERS
24. REPLACE LIGHT BULBS AND WIRES
25. REPLACE SENDING UNITS OR GAGES
26. REPLACE UNIVERSAL JOINTS
27. REPLACE DIFFERENTIAL, FRONT OR REAR
28. REPLACE DIFFERENTIAL SEAL
29. REPLACE TRANSMISSION SEALS
30. REPLACE SLEEVE, SHAFT AND CROSS WHEEL DRIVE SEALS, FLANGE AND SPINDLE
31. REPLACE WHEEL BEARING
32. ADJUST WHEEL BEARING
33. ADJUST SERVICE BRAKES
34. ADJUST PARKING BRAKES
35. REPLACE SERVICE BRAKES
36. REPLACE SERVICE BRAKE LINES AND HOSES
37. REPLACE MASTER CYLINDER
38. REPLACE WHEEL CYLINDER
39. REPLACE PARKING BRAKES
40. ADJUST TOE IN
41. REPLACE UPPER AND LOWER BALL JOINTS
42. REPLACE UPPER AND LOWER SUSPENSION ARMS
43. REPLACE SPRINGS
44. REPLACE SHOCK ABSORBERS
45. REPLACE FRONT SHOCK BUSHINGS
46. REPLACE OR REPAIR TIRES
47. REPLACE WINDSHIELD WIPER MOTOR
48. REPLACE WINDSHIELD WIPER ARM AND BLADE
49. REPLACE WINDSHIELD
50. REPLACE PERSONNEL HEATER ASSEMBLY
51. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
52. OTHER

**AUTOMOTIVE MECHANIC
MOS 63B/S AND 63N/T
CORRECTIVE MAINTENANCE TASK LIST
TRUCK, 2½ TON, M35 SERIES/TRUCK, 5 TON, M54 SERIES**

1. ADJUST CLUTCH CONTROLS AND LINKAGE
2. REPLACE CLUTCH CONTROLS AND LINKAGE
3. REPLACE ELECTRICAL IN-TANK FUEL PUMP
4. TIGHTEN FUEL LINES AND FITTINGS
5. ADJUST/REPLACE ACCELERATOR CONTROLS AND LINKAGE
6. REPLACE FUEL OR OIL FILTERS
7. REPLACE EXHAUST GASKETS
8. REPLACE AIR CLEANER
9. REPLACE RADIATOR
10. REPLACE RADIATOR HOSE AND CLAMPS
11. REPLACE WATER PUMP
12. ADJUST FAN BELT
13. REPLACE FAN BELT
14. REPLACE STARTER
15. REPLACE BATTERY, CABLES AND/OR CLAMPS
16. REPLACE 25 AMP VOLTAGE REGULATOR
17. REPLACE GENERATOR/ALTERNATOR
18. REPLACE LIGHTS AND SWITCHES
19. REPLACE SENDING UNITS OR GAGES
20. REPAIR WIRING/CABLES
21. REPLACE HORN AND/OR WIRING
22. REPLACE EMERGENCY WARNING BUZZER
23. REPLACE UNIVERSAL JOINT
24. ADJUST SERVICE BRAKES
25. REPLACE HAND BRAKE SHOE
26. REPLACE SERVICE BRAKE SHOE
27. REPLACE MASTER CYLINDER
28. REPLACE WHEEL CYLINDER
29. REPLACE BRAKE LINES, FITTINGS OR HOSE
30. REPLACE HYDRAULIC CYLINDER (HYDROVAC)
31. REPAIR AIR SYSTEM LINES AND FITTINGS
32. REPLACE AIR COMPRESSOR
33. REPLACE AIR COMPRESSOR DRIVE BELT
34. REPLACE/REPACK WHEEL BEARINGS AND OUTER SEALS
35. REPLACE INNER AXLE SEALS
36. REPLACE/REPAIR TIRES
37. REPLACE/TIGHTEN LUG STUDS AND NUTS
38. ADJUST STEERING GEAR
39. REPLACE PITMAN ARM
40. REPLACE DRAG LINK COMPONENTS
41. REPLACE STEERING KNUCKLE BOOT
42. REPLACE SPRING SHACKLES AND BOLTS
43. REPLACE WINDSHIELD WIPER MOTOR
44. REPLACE WINDOWS, DOORS, OR MIRRORS
45. REPLACE OR REPAIR WINCH CABLES, SHEAR PIN, OR DRIVE SHAFT
46. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS
47. OTHER

**AUTOMOTIVE MECHANIC
MOS 63B/S AND 63N/T
CORRECTIVE MAINTENANCE TASK LIST
TRUCK, 1½ TON, M561/792**

1. REPLACE OIL FILTER ELEMENT
2. REPLACE AIR BOX DRAIN TUBE
3. ADJUST ACCELERATOR LINKAGE
4. ADJUST ENGINE STOP CABLE
5. REPLACE AIR CLEANER ELEMENT
6. REPLACE EXHAUST GASKETS
7. REPLACE MUFFLER AND/OR TAILPIPE
8. ADJUST BELTS
9. REPLACE BELTS
10. REPLACE RADIATOR
11. REPLACE STARTER MOTOR
12. REPAIR WIRING
13. REPLACE BATTERIES, CABLES AND/OR CLAMPS
14. REPLACE LIGHTS
15. REPLACE HORN ASSEMBLY
16. ADJUST TRANSMISSION CONTROL AND LINKAGE
17. REPLACE UNIVERSAL JOINT
18. ADJUST PARKING BRAKE HANDLE AND LINKAGE
19. REPLACE MASTER CYLINDER
20. ADJUST AND BLEED SERVICE BRAKES
21. REPLACE FRONT OR REAR STEERING GEAR BOX
22. REPLACE TRACTOR AND CARRIER STEERING KNUCKLE
23. REPLACE TRACTOR AND CARRIER TIE ROD ASSEMBLIES
24. REPAIR TRACTOR FRONT TORQUE TUBE BEARING
25. REPLACE TRACTOR FRONT AND CARRIER SHOCK ABSORBERS
26. REPLACE INNER AND OUTER CENTRAL AXLE SHOCK ABSORBERS
27. REPLACE STEERING WHEEL
28. REPLACE WINDSHIELD WIPER MOTOR
29. REPLACE PERSONNEL HEATER
30. REPLACE BILGE PUMP
31. REPLACE WATERTIGHT SEALS
32. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS
33. OTHER

**AUTOMOTIVE MECHANIC, MOS 63B/S
CORRECTIVE MAINTENANCE TASK LIST
TRUCK, 8 OR 10 TON M520, M559, M553 (GOER)**

1. REPLACE GENERATOR
2. REPLACE AND/OR ADJUST BELTS
3. REPLACE STARTER
4. REPAIR WIRING
5. REPLACE PRIMARY FUEL FILTER ELEMENT
6. REPLACE SECONDARY FUEL FILTER ELEMENT
7. REPLACE KING PINS
8. REPLACE/REPAIR HORN
9. REPAIR HYDRAULIC SYSTEM
10. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS
11. OTHER

**COMM. SYSTEMS MECHANIC, MOS 31V
CORRECTIVE MAINTENANCE TASK LIST**

1. TEST/REPLACE ANTENNA ELEMENT, AT-1095 OR AS-1730
2. TEST/REPLACE ANTENNA MATCHING UNIT, MX-6707
3. TEST/REPLACE RF CABLE, CG-1773
4. TEST/REPLACE CABLE, CX-4722/4723
5. TEST RECEIVER/TRANSMITTER, RT-246 OR 524
6. TEST RECEIVER, R-442
7. TEST/REPLACE AMPLIFIER, AM-2060
8. TEST/REPLACE MOUNTING, MT-1029 OR 1898
9. TEST/REPLACE AUDIO FREQUENCY AMPLIFIER, AM-1780
10. TEST/REPLACE INTERCOM CONTROL SET, C-2296/7/8
11. TEST/REPLACE RADIO CONTROL SET, C-2299
12. TEST/REPLACE FREQUENCY SELECTOR CONTROL, C-2742
13. TEST/REPLACE POWER CABLE, CX-4655 (VRC-64)
14. TEST/REPLACE SUPPRESSOR, MX-7778A
15. TEST/REPAIR HELMET, CVC
16. TEST/REPAIR SWITCHBOARD, SB-22 OR SB-993
17. TEST/REPAIR TELEPHONE, TA-312 OR TA-1
18. TEST LOUDSPEAKER, LS-454
19. TEST MICROPHONE OR HANDSET
20. SERVICE WIRE, WD-1 AND/OR REEL, DR-8
21. OTHER

APPENDIX C

STEPS IN TASK PERFORMANCE

These steps identify what actions are and are not included in performing a task. The steps may also serve as an aid to trainers when developing technical training for a task.

Tasks required to accomplish preventive maintenance are wide-ranging in scope, extensive in number, and subject to complex permutations and combinations of various tasks. Extremely basic technical knowledge is required which makes preventive maintenance training simple to execute. For these reasons performance steps were not developed for preventive maintenance tasks.

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 11C/19D, OTHER **FOR: CARRIER, M113A1**

TASK	PERFORMANCE STEPS
1. REPLACE TRACK SHOES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shrouds c. Loosen track tension d. Install track jacks e. Remove pins f. Remove track jacks g. Remove track shoe h. Install in reverse order i. Adjust track tension
2. REPLACE TRACK ASSEMBLY OR TRACK BLOCK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shrouds c. Loosen track tension d. Install track jacks e. Remove pin f. Remove track jacks g. To replace track assembly, drive carrier slowly in reverse and guide track over road wheels and idler wheels h. To replace track block, remove additional pins i. Install in reverse order j. Adjust track tension
3. ADJUST TRACK TENSION	<ul style="list-style-type: none"> a. Move carrier and let it coast to a stop on smooth, level ground b. Measure track tension above second road wheel c. Tighten track by pumping grease into adjuster; or loosen track by bleeding adjuster
4. REPLACE ROADWHEEL	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shroud c. Loosen track tension d. Break track e. Position lifter under arm f. Loosen nuts g. Drive carrier forward to lift wheel h. Remove nuts i. Remove wheel j. Install in reverse order k. Adjust track tension

TASK	PERFORMANCE STEPS
5. REPLACE IDLER ARM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shroud c. Break track d. Remove idler wheel and spindle e. Remove hub bearings and seal f. Remove track adjuster g. Tighten screws to specified torque h. Remove idler wheel arm assembly i. Install in reverse order j. Adjust track tension
6. REPLACE AIR CLEANER*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Unlatch clamps c. Remove container d. Remove element from container e. Install in reverse order
7. REPLACE FUEL FILTER*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch off c. Disconnect battery ground lead d. Close fuel flow valve e. Drain fuel f. Close drain valve g. Remove shell h. Discard element and gasket i. Install replacement element j. Fill shell with fuel k. Install shell with new gasket l. Connect battery lead and open fuel line m. Turn master switch on, start engine, and check for leaks
8. REPLACE FUEL GAGE*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch off c. Remove caution plate as required d. Swing instrument panel out e. Disconnect fuel gage lead f. Remove fuel gage g. Install in reverse order
9. REPLACE OIL FILTER ELEMENT*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain filter c. Detach filter case d. Discard element and gasket e. Install new element and gasket f. Attach filter case

*Mechanic task done by crew.

TASK	PERFORMANCE STEPS
10. ADJUST LATERALS (STEERING CONTROL)*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lower trim vane c. Block tracks d. Disconnect oil inlet line (M577 only) e. Remove differential access plugs f. Release laterals g. Turn brake band adjusting nut h. Position steering lever in second notch i. Measure release pressure j. Adjust brake band nut k. Install access plugs l. Connect oil inlet line m. Check for leaks
11. REMOVE OR INSTALL PERISCOPE, M17	<ul style="list-style-type: none"> a. Loosen retaining clamps or thumb screws b. Remove periscope from channel c. Install in reverse order
12. REMOVE OR INSTALL PERISCOPE, M19 (IR)	<ul style="list-style-type: none"> a. Turn main light switch and infrared power pack switch off b. Verify that infrared power pack is deenergized c. Move power cable from periscope to stowage plug d. Unlock and remove periscope e. Stow periscope f. Lock and plug latch g. Install in reverse order

*Mechanic task done by crew.

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 12F **FOR: AVLB, M60A1L**

TASK	PERFORMANCE STEPS
1. REPLACE TRACK ASSEMBLY OR TRACK BLOCK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Partially remove end connectors d. Position track jacks and tighten e. Remove end connectors f. Remove track jacks g. Remove center guide h. To replace track block, remove additional end connectors and center guide i. To remove entire track, back tank up until old track is off j. Install new track or track block in reverse sequence k. Adjust track tension
2. REPLACE TRACK PADS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove nut c. Remove pad d. Install in reverse order
3. REPLACE END CONNECTORS AND/OR CENTER GUIDES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Partially remove end connectors d. Position track jacks and tighten e. Remove end connectors f. Loosen centerguide nut g. Loosen track jacks h. Remove centerguide i. Install replacements in reverse order
4. ADJUST TRACK TENSION	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Move tank backward at least two tank lengths and coast to a stop c. Place weighted string over end connectors above first and second support rollers d. Measure vertical distance between center of string and nearest end connector e. Remove locking screw on track adjusting link f. Adjust track tension

TASK	PERFORMANCE STEPS
5. REPLACE ROAD WHEEL	<ul style="list-style-type: none"> g. Install locking screw and washer h. Lubricate adjusting link <ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track or remove center guide, if necessary c. Remove road wheel d. Install in reverse order e. Join track f. Adjust track tension
6. REPLACE ROAD WHEEL/ SUPPORT ROLLER BEARINGS AND SEALS*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise track c. Remove center guide, if necessary d. Remove hub and bearings e. Install replacement bearings and lubricate f. Install new seal and hub
7. REPLACE ROAD WHEEL ARM*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track c. Remove road wheel d. Remove torsion bar e. Disconnect retainer f. Remove arm g. Remove old gaskets and seals h. Install new gaskets and seals i. Replace arm, torsion bar and road wheel j. Join track k. Adjust track tension
8. REPLACE SUPPORT ROLLER*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track, or remove center guide, if necessary c. Raise track d. Remove support roller e. Install in reverse order f. Join track g. Adjust track tension
9. REPLACE TORSION BAR*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block up support arm c. Remove road wheel and hub assembly d. Remove torsion bar e. Partially install replacement torsion bar f. Aline splines of bar and anchor g. Completely install torsion bar h. Pack cavity with lubricant

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
10. REPLACE SHOCK ABSORBERS*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pins and mounting pins c. Remove shock absorber d. Install in reverse order
11. REPLACE COMPENSATING IDLER WHEEL HUB AND ARM*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track adjusting link c. Remove compensating idler wheel hub and arm d. Install in reverse order
12. REPLACE COMPENSATING IDLER ASSEMBLY*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track c. Remove compensating idler wheel d. Remove track adjusting link assembly e. Remove compensating idler f. Remove packing from hull g. Disassemble idler h. Replace components as necessary i. Install spacer j. Lubricate all bearing surfaces k. Install in reverse order l. Join track m. Adjust track tension
13. REPLACE DRIVE SPROCKET*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove rear fender c. Break track d. Remove hub and sprocket assembly e. Install in reverse order f. Join track g. Adjust track tension
14. REMOVE BACK DECK	<ul style="list-style-type: none"> a. Traverse turret 90 degrees to left or right b. Remove external handset box c. Open back deck grill doors d. Open rear exhaust grill doors e. Remove intake grill doors f. Traverse turret to gain access to deck bolts g. Remove deck bolts h. Install sling and remove deck

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
15. INSTALL BACK DECK	<ul style="list-style-type: none"> a. Traverse turret 90 degrees to left or right b. Install sling and position deck on hull c. Traverse turret to gain access to deck bolt locations d. Install deck bolts e. Mount intake grill doors f. Close back deck grill doors g. Close exhaust grill doors h. Install external handset box
16. REMOVE DEFECTIVE/ INOPERABLE POWERPACK*	<ul style="list-style-type: none"> a. Block tank front and rear b. Traverse turret 90 degrees to left or right c. Put transmission lever in park and turn off master switch d. Disconnect battery ground cables e. Remove back deck and transmission shroud f. Remove access plates g. Disconnect generator air duct (2A & 2D) h. Disconnect tachometer i. Disconnect power takeoff shaft j. Disconnect fuel lines k. Disconnect air cleaner hoses and fire extinguisher tubing l. Disconnect brake control rods, steering and shifting linkage m. Disconnect brake cylinder and lines n. Disconnect universal joint and final drive adapter o. Disconnect transmission mounting bracket p. Install sling and raise powerpack slightly q. Disconnect wiring harness r. Remove powerpack
17. INSTALL REPAIRED POWER- PACK*	<ul style="list-style-type: none"> a. Install sling and position powerpack in well b. Connect wiring harness c. Lower powerpack and remove sling d. Connect transmission mounting bracket e. Connect universal joint and final drive adapter f. Connect brake cylinder and lines g. Connect brake control rods, steering and shifting linkage h. Connect air cleaner hoses and fire extinguisher tubing

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> i. Connect fuel lines j. Connect power takeoff shaft k. Connect tachometer l. Connect generator air duct m. Install access plates n. Install back deck and transmission shroud o. Connect battery ground cables p. Test powerpack operation
18. REMOVE POWERPACK TO DO OTHER TASK(S)	See Task Number 16
19. INSTALL POWERPACK AFTER COMPLETING OTHER TASK(S)	See Task Number 17
20. REPLACE FINAL DRIVE*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove back deck and transmission shroud c. Remove powerpack d. Remove rear fender e. Remove drain plug and drain oil f. Break track and remove from sprocket g. Disconnect final drive adapter h. Remove final drive i. Install in reverse order j. Fill with oil
21. REPLACE FINAL DRIVE SEALS*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack c. Remove adapter assembly from input shaft d. Pry seal out e. Install new seal f. Apply coat of oil to seal and adapter g. Install in reverse order
22. REPLACE FUEL FILTER*	<ul style="list-style-type: none"> a. Remove powerpack b. Disconnect hoses from elbows c. Remove fuel filter d. Remove connector filter e. Remove elbows f. Install in reverse order
23. REPLACE OIL FILTER*	<ul style="list-style-type: none"> a. Remove upper engine access cover b. Remove fire extinguisher line c. Drain engine oil d. Remove filter element cover e. Loosen screw and remove self-locking nuts and washers

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
24. REPLACE AIR CLEANER FILTER*	<ul style="list-style-type: none"> h. Install in reverse order, using new filter elements, gaskets, self-locking nuts and washers i. Fill with oil a. Open access door b. Remove filter c. Clean or replace as required d. Install in reverse order
25. REPLACE BATTERIES, CABLES AND/OR CLAMPS*	<ul style="list-style-type: none"> a. Traverse turret to expose batteries b. Set master battery switch to off c. Remove three battery ground cables and secure d. Slide protective boots from connector clamps (terminals) e. Remove six battery connector clamps from posts f. Remove holddown retainer g. Slide protective boots from positive clamps h. Remove positive clamps from posts i. Remove batteries j. Replace batteries, cables and/or clamps as required k. Install in reverse order
26. REMOVE OR INSTALL DRIVER'S PERISCOPE, M24 (IR)	<ul style="list-style-type: none"> a. Set IR power switch to OFF b. Set master battery switch to OFF c. Set BO selector to blackout drive d. Set lighting control lever to center (up) position e. Disconnect power cable from periscope and connect to stowage receptacle f. Install dust cover on power receptacle g. Pull release bar and remove M24 periscope h. Place M24 periscope in stowage box i. Latch periscope lid on hatch j. Raise M27 periscope k. Install in reverse order l. Adjust periscope headrest and focus
27. REMOVE OR INSTALL DRIVER'S PERISCOPE, M27	<ul style="list-style-type: none"> a. Loosen nuts, and push support forward (front only) b. Hold periscope and rotate retainers c. Lower periscope d. Place periscope in stowage box e. Install in reverse order

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
28. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

*Mechanic task - done by crew.

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 19E **FOR: TANK, M60A1**

TASK	PERFORMANCE STEPS
1. REPLACE TRACK ASSEMBLY OR TRACK BLOCK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Partially remove end connectors d. Position track jacks and tighten e. Remove end connectors f. Remove track jacks g. Remove center guide h. To replace track block, remove additional end connectors and center guide i. To remove entire track, back tank up until old track is off j. Install new track or track block in reverse sequence k. Adjust track tension
2. REPLACE TRACK PADS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove nut c. Remove pad d. Install in reverse order
3. REPLACE END CONNECTORS AND/OR CENTER GUIDES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Partially remove end connectors d. Position track jacks and tighten e. Remove end connectors f. Loosen centerguide nut g. Loosen track jacks h. Remove centerguide i. Install replacements in reverse order
4. ADJUST TRACK TENSION	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Move tank backward at least two tank lengths and coast to a stop c. Place weighted string over end connectors above first and second support rollers d. Measure vertical distance between center of string and nearest end connector e. Remove locking screw on track adjusting link f. Adjust track tension

TASK	PERFORMANCE STEPS
5. REPLACE ROAD WHEEL	<ul style="list-style-type: none"> g. Install locking screw and washer h. Lubricate adjusting link a. Diagnose/verify fault b. Break track or remove center guide, if necessary c. Remove road wheel d. Install in reverse order e. Join track f. Adjust track tension
6. REPLACE ROAD WHEEL/ SUPPORT ROLLER BEARINGS AND SEALS*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise track c. Remove center guide, if necessary d. Remove hub and bearings e. Install replacement bearings and lubricate f. Install new seal and hub
7. REPLACE ROAD WHEEL ARM*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track c. Remove road wheel d. Remove torsion bar e. Disconnect retainer f. Remove arm g. Remove old gaskets and seals h. Install new gaskets and seals i. Replace arm, torsion bar and road wheel j. Join track k. Adjust track tension
8. REPLACE SUPPORT ROLLER*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track or remove center guides, if necessary c. Raise track d. Remove support roller e. Install in reverse order f. Join track g. Adjust track tension
9. REPLACE TORSION BAR*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block up support arm c. Remove road wheel and hub assembly d. Remove torsion bar e. Partially install replacement torsion bar f. Aline splines of bar and anchor g. Completely install torsion bar h. Pack cavity with lubricant

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
10. REPLACE SHOCK ABSORBERS*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pins and mounting pins c. Remove shock absorber d. Install in reverse order
11. REPLACE COMPENSATING IDLER WHEEL HUB AND ARM*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track adjusting link c. Remove compensating idler wheel hub and arm d. Install in reverse order
12. REPLACE COMPENSATING IDLER ASSEMBLY*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track c. Remove compensating idler wheel d. Remove track adjusting link assembly e. Remove compensating idler f. Remove packing from hull g. Disassemble idler h. Replace components as necessary i. Install spacer j. Lubricate all bearing surfaces k. Install in reverse order l. Join track m. Adjust track tension
13. REPLACE DRIVE SPROCKET*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove rear fender c. Break track d. Remove hub and sprocket assembly e. Install in reverse order f. Join track g. Adjust track tension
14. REMOVE BACK DECK	<ul style="list-style-type: none"> a. Traverse turret 90 degrees to left or right b. Remove external handset box c. Open back deck grill doors d. Open rear exhaust grill doors e. Remove intake grill doors f. Traverse turret to gain access to deck bolts g. Remove deck bolts h. Install sling and remove deck
15. INSTALL BACK DECK	<ul style="list-style-type: none"> a. Traverse turret 90 degrees to left or right b. Install sling and position deck on hull c. Traverse turret to gain access to deck bolt locations

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
16. REMOVE DEFECTIVE/ INOPERABLE POWERPACK*	<ul style="list-style-type: none"> d. Install deck bolts e. Mount intake grill doors f. Close back deck grill doors g. Close exhaust grill doors h. Install external handset box <ul style="list-style-type: none"> a. Block tank front and rear b. Traverse turret 90 degrees to left or right c. Put transmission lever in park and turn off master switch d. Disconnect battery ground cables e. Remove back deck and transmission shroud f. Remove access plates g. Disconnect generator air duct (2A & 2D) h. Disconnect tachometer i. Disconnect power takeoff shaft j. Disconnect fuel lines k. Disconnect air cleaner hoses and fire extinguisher tubing l. Disconnect brake control rods, steering and shifting linkage m. Disconnect brake cylinder and lines n. Disconnect universal joint and final drive adapter o. Disconnect transmission mounting bracket p. Install sling and raise powerpack slightly q. Disconnect wiring harness r. Remove powerpack
17. INSTALL REPAIRED POWER- PACK*	<ul style="list-style-type: none"> a. Install sling and position powerpack in well b. Connect wiring harness c. Lower powerpack and remove sling d. Connect transmission mounting bracket e. Connect universal joint and final drive adapter f. Connect brake cylinder and lines g. Connect brake control rods, steering and shifting linkage h. Connect air cleaner hoses and fire extinguisher tubing i. Connect fuel lines j. Connect power takeoff shaft k. Connect tachometer l. Connect generator air duct

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> m. Install access plates n. Install back deck and transmission shroud o. Connect battery ground cable p. Test powerpack operation
18. REMOVE POWERPACK TO DO OTHER TASK(S)	See Task Number 16
19. INSTALL POWERPACK AFTER COMPLETING OTHER TASK(S)	See Task Number 17
20. REPLACE FINAL DRIVE*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove back deck and transmission shroud c. Remove powerpack d. Remove rear fender e. Remove drain plug and drain oil f. Break track and remove from sprocket g. Disconnect final drive adapter h. Remove final drive i. Install in reverse order j. Fill with oil
21. REPLACE FINAL DRIVE SEALS*	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack c. Remove adapter assembly from input shaft d. Pry seal out e. Install new seal f. Apply coat of oil to seal and adapter g. Install in reverse order
22. REPLACE FUEL FILTER*	<ul style="list-style-type: none"> a. Remove powerpack b. Disconnect hoses from elbows c. Remove fuel filter d. Remove connector filter e. Remove elbows f. Install in reverse order
23. REPLACE OIL FILTER*	<ul style="list-style-type: none"> a. Remove upper engine access cover b. Remove fire extinguisher line c. Drain engine oil d. Remove filter element cover e. Loosen screw and remove self-locking nuts and washers

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
24. REPLACE AIR CLEANER FILTER*	<ul style="list-style-type: none"> h. Install in reverse order, using new filter elements, gaskets, self-locking nuts and washers i. Fill with oil a. Open access door b. Remove filter c. Clean or replace as required d. Install in reverse order
25. REPLACE BATTERIES, CABLES AND/OR CLAMPS*	<ul style="list-style-type: none"> a. Traverse turret to expose batteries b. Set master battery switch to off c. Remove three battery ground cables and secure d. Slide protective boots from connector clamps (terminals) e. Remove six battery connector clamps from posts f. Remove holddown retainer g. Slide protective boots from positive clamps h. Remove positive clamps from posts i. Remove batteries j. Replace batteries, cables and/or clamps as required k. Install in reverse order
26. REMOVE OR INSTALL DRIVER'S PERISCOPE, M24 (IR)	<ul style="list-style-type: none"> a. Set IR power switch to OFF b. Set master battery switch to OFF c. Set BO selector to blackout drive d. Set lighting control lever to center (up) position e. Disconnect power cable from periscope and connect to stowage receptacle f. Install dust cover on power receptacle g. Pull release bar and remove M24 periscope h. Place M24 periscope in stowage box i. Latch periscope lid on hatch j. Raise M27 periscope k. Install in reverse order l. Adjust periscope headrest and focus
27. REMOVE OR INSTALL DRIVER'S PERISCOPE, M27	<ul style="list-style-type: none"> a. Loosen nuts, and push support forward (front only) b. Hold periscope and rotate retainers c. Lower periscope d. Place periscope in stowage box e. Install in reverse order

*Mechanic task - done by crew.

TASK	PERFORMANCE STEPS
28. REMOVE OR INSTALL LOADER'S PERISCOPE, M37	<ol style="list-style-type: none"> Hold periscope and push up on release bar Remove periscope Place periscope in stowage box Latch periscope lid on hatch Install in reverse order
29. REMOVE OR INSTALL TC/GUNNER'S PERISCOPE, M32 (IR)	<ol style="list-style-type: none"> Turn off power Raise headrests Hold periscope and release latches Remove periscope Install in reverse order
30. REPAIR BREECH BLOCK	<ol style="list-style-type: none"> Diagnose/verify fault Remove breech block Disassemble breech block Replace defective parts Clean and lubricate components Assemble and install in reverse order
31. REPAIR BREECH OPERATING MECHANISM*	<ol style="list-style-type: none"> Diagnose/verify fault Remove firing pin components Install eyebolt Secure breech block with chain hoist Lower breech block onto turret floor Remove and inspect components Clean and lubricate components Replace unserviceable parts Assemble and install in reverse order
32. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

*Mechanic task - done by crew.

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 45N **FOR: TANK, M60A1**

TASK	PERFORMANCE STEPS
1. REPLACE SLIP RING INTERFERENCE SWITCH	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Drain hydraulic system d. Place gun in travel lock e. Remove slip ring cover shields and plates f. Disconnect electrical connectors g. Remove defective switch h. Install in reverse order i. Test and adjust
2. REPLACE NO-BAK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Engage turret lock c. Turn turret power switch to off d. Remove manual traversing drive linkage e. Remove mounting screws f. Remove no-bak and shims g. Mount replacement no-bak h. Measure backlash i. Install shims as required j. Install manual traversing drive linkage
3. REPLACE BACK DECK CLEARANCE VALVE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect electrical connector c. Remove deck clearance valve d. Install in reverse order
4. REPAIR MAIN GUN FIRING CIRCUIT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Repair faulty circuits c. Test operation
5. REPLACE STABILIZATION SYSTEM CONTROL BOX	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Engage turret lock d. Disconnect electrical connector e. Remove control box f. Install in reverse order g. Adjust traverse and elevation gain
6. REPAIR STABILIZATION SYSTEM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Replace faulty parts c. Reconnect all electrical connectors d. Test operation

TASK	PERFORMANCE STEPS
7. ADJUST STABILIZATION SYSTEM	<ul style="list-style-type: none"> a. Turn master battery switch to off b. Remove control box cover c. Rotate traverse gain potentiometer screw fully counterclockwise d. Turn on power to control box e. Adjust traverse gain f. Turn elevation potentiometer screw fully counterclockwise g. Adjust elevation gain h. Turn off power to control box i. Install cover
8. REPLACE SUPERELEVATION ACTUATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Release hydraulic pressure c. Remove flexible shaft d. Remove drive shaft e. Disconnect hydraulic line f. Plug open lines and ports g. Remove superelevation actuator h. Install in reverse order i. Charge and bleed system
9. REPLACE SUPERELEVATION ACTUATOR CABLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cap from actuator c. Remove cable from ballistic computer cap d. Remove cable clamps e. Remove cable f. Remove cap from cable g. Install in reverse order
10. REPLACE ELEVATION SYSTEM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lower hydraulic pressure from 0 psi c. Remove hydraulic tubes from locking valve and manifold d. Remove electrical connector from elevation servo valve e. Remove nut and shear bolts f. Remove elevating mechanism g. Install in reverse order h. Bleed turret hydraulic system

TASK	PERFORMANCE STEPS
11. BLEED TURRET HYDRAULIC SYSTEM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Fill reservoir with oil c. Elevate and depress gun at least 6 times d. Open rear bleeder valve of elevating mechanism e. Elevate gun until fluid shows clear in valve (no bubbles) f. Close rear valve g. Position gun at full elevation h. Open front bleeder valve i. Depress gun until fluid shows clear in valve j. Close front valve k. Position gun at full depression l. Disconnect manual depression line at port "ME" m. Rotate hand elevation pump until fluid shows clear n. Connect manual depression line o. Position gun at full elevation p. Rotate hand elevation pump handle 50 times q. Check operation r. Disconnect elevation shaft from computer s. Rotate free end of shaft to limit in both directions t. Open bleeder valves "B" and "A" in turn until fluid runs clear u. Connect shaft to computer v. Repeat steps c through j above
12. REPLACE MANUAL ELEVATION PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lower hydraulic system pressure to 0 psi c. Loosen hydraulic line and drain fluid d. Remove accumulator from adaptor e. Remove O-ring f. Plug hydraulic line and adapter openings g. Install in reverse order h. Check oil level in reservoir

TASK	PERFORMANCE STEPS
13. PURGE AND CHARGE MANUAL ELEVATION SYSTEM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove plugs from manual depression hydraulic line and adapter c. Install new O ring on accumulator d. Attach accumulator to adapter e. Attach hydraulic line to riser f. Using manual elevation pump handle, depress gun to maximum depression g. Bleed manual elevation system h. Check oil level in reservoir
14. REPLACE ANTI-BACKLASH CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Release hydraulic pressure c. Disconnect hydraulic lines d. Remove backlash cylinder e. Disassemble and replace defective parts f. Assemble and install in reverse order g. Charge and bleed system
15. ADJUST BACKLASH	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Engage turret lock c. Turn turret power switch to off d. Remove traverse backlash assembly e. Remove pinion guard plates f. Remove snaprings and drive pinions g. Adjust backlash h. Install in reverse order
16. REPLACE MAIN ACCUMULATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove tube assemblies and accumulator tee c. Traverse turret d. Remove lower accumulator retaining straps e. Reduce accumulator gas pressure f. Remove upper accumulator retaining straps g. Remove accumulator h. Remove reducers and packings i. Install in reverse order j. Charge accumulator k. Fill hydraulic system and bleed

TASK	PERFORMANCE STEPS
17. REPLACE ACCUMULATOR PRESSURE GAUGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lower hydraulic pressure to 0 psi c. Remove pressure gauge from connector d. Remove packing from connector e. Plug pressure gauge and connector openings f. Install in reverse order g. Bleed turret hydraulic system
18. CHARGE MAIN ACCUMULATOR	<ul style="list-style-type: none"> a. Turn master battery off b. Turn turret power switch to off c. Switch traverse lock set to locked position d. Check nitrogen pressure e. Lower hydraulic pressure to 0 psi f. Purge charging lines g. Fill accumulator with nitrogen h. Bleed charging lines i. Check hydraulic system fluid level j. Bleed turret hydraulic system
19. REPLACE TC'S HANDLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove traverse rod, elevation rod and rod end c. Disconnect cable plug d. Remove control handle e. Install in reverse order
20. REPAIR GUNNER'S HANDLE PALM SWITCHES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Turn turret power switch to off d. Remove control box cover e. Remove handle cover f. Remove switches g. Repair/replace switches h. Install in reverse order i. Adjust triggers
21. REPAIR TC'S HANDLE PALM SWITCHES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Turn turret power switch to off d. Lock turret traverse e. Remove electrical harness connector f. Remove elevation and traverse rods

TASK	PERFORMANCE STEPS
21. REPLACE GUNNER'S CONTROL BOX	<ul style="list-style-type: none"> g. Remove setscrew and pivot shaft h. Disconnect rod end from handle of elevating arm i. Remove control handle j. Remove right half of handle k. Remove defective switches l. Install in reverse order <ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Lock turret traverse d. Remove gunner's stabilization control selector e. Disconnect electrical connector f. Remove control box g. Install in reverse order
22. REPLACE/ADJUST LOADER'S SAFETY SWITCH	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Disconnect electrical connectors d. Remove ground lead e. Remove loader's guard and safety switch f. Install in reverse order g. Adjust switch
23. REPLACE SOLENOID VALVE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Release hydraulic pressure d. Remove tee fitting and packing ("O" ring) e. Remove nipple and packing from valve f. Remove defective valve g. Install in reverse order h. Charge and bleed system

TASK	PERFORMANCE STEPS
25. PERFORM SYNCHRONIZATION CHECK (RAMP METHOD)	<ul style="list-style-type: none"> a. Place tank on level ground with rear toward ramp on hill b. Remove superelevation from computer c. Turn off ballistic computer d. Turn off rangefinder e. Index computer to number of rounds fired f. Remove firing mechanism g. Boresight gun h. Adjust sights i. Boresight weapon at 89, 178, and 267 mils j. Back tank up on ramp or hill k. Check backlash corrective factor at 89, 178, and 267 mils l. Check superelevation m. Install firing mechanism
26. PERFORM SYNCHRONIZATION CHECK - INDOOR METHOD	<ul style="list-style-type: none"> a. Remove all superelevation b. Occlude objective windows of sights and left rangefinder end housing window c. Turn off ballistic computer d. Turn off rangefinder e. Index computer to number of rounds fired f. Set rangefinder scale to 500 meters g. Remove firing mechanism h. Boresight gun i. Adjust sights j. Measure elevation, using M1 Quadrant, and record reading k. Depress gun 20-35 mils and relay on target l. Measure elevation, using M1 Quadrant, and record reading m. Check and relay left rangefinder reticle and record reading n. Check and relay sights and record readings o. Repeat steps m and n 3 times. Divide readings by 3 and use average

TASK	PERFORMANCE STEPS
27. REPLACE AZIMUTH INDICATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect electrical connector c. Remove azimuth indicator d. Install in reverse order
28. REPLACE M13A2/M13A1D BALLISTIC COMPUTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Disconnect power cable d. Remove locking wire from couplings e. Remove flexible shaft f. Slide back collar g. Separate drive shaft and computer output shaft h. Remove computer i. Install in reverse order j. Test and adjust tolerance
29. REPLACE RANGEFINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master battery switch to off c. Disconnect electrical lead d. Disconnect ground lead e. Disconnect mechanical linkage from rangefinder to computer f. Disconnect on/off switch to computer from rangefinder g. Remove ballistic shields h. Remove end housings i. Remove rangefinder j. Install in reverse order k. Test and adjust
30. PURGE AND CHARGE SIGHTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove entrance port valve cap or screw c. Attach nitrogen tank hose to port d. Open tank pressure regulator valve and purge to proper reading e. Rotate pressure regulator valve counter-clockwise to obtain reading of 1 psi f. Install exhaust port screw or plug g. Charge sight h. Close pressure regulator valve i. Remove exhaust port screw or plug j. Remove hose k. Install entrance port valve cap or screw

TASK	PERFORMANCE STEPS
31. REPLACE M32/36 LIGHT CONTROL SOURCE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove gunner's periscope c. Turn turret power off d. Disconnect cable connector e. Remove light source control f. Install in reverse order
32. REPLACE TURRET POWER DISTRIBUTION BOX	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove gunner's seat c. Remove power pack blower d. Disconnect cables e. Remove mounting screws f. Remove power distribution box g. Remove brackets from box h. Install in reverse order
33. ADJUST CUPOLA CRADLE ASSEMBLY	<ul style="list-style-type: none"> a. Install caliber .50 machine gun b. Remove ballistic cover c. Put wooden block under cradle d. Remove inner screws e. Remove wooden block f. Test elevation and depression with hand crank g. Use breaker bar to adjust spring tension h. Install in reverse order
34. REPLACE/REPAIR CRADLE JACK SCREW ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Elevate cradle c. Block cradle d. Disconnect firing switch connectors e. Disconnect periscope link assembly f. Remove jack screw assembly g. Repair assembly h. Install in reverse order
35. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63N **FOR: CARRIER, M113A1**

TASK	PERFORMANCE STEPS
1. REMOVE DEFECTIVE/INOPER- ATIVE POWER PLANT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch off c. Disconnect battery ground lead d. Remove bulkhead cables e. Drain cooling system f. Remove air cleaner assembly and hose g. Disconnect exhaust system h. Remove radiator hoses and tubes i. Remove fan and drive belts j. Raise deck and grill assembly k. Disconnect fuel hose l. Disconnect accelerator pedal linkage and fuel shutoff m. Disconnect shifting linkages n. Remove propeller shaft, oil temperature wire, and oil hoses from transmission differential o. Disconnect starter ground wire p. Remove mounting bolts q. Attach power plant sling to power plant and remove
2. INSTALL REPAIRED POWER PLANT	<ul style="list-style-type: none"> a. Attach sling and position power plant in well b. Install mounting bolts and secure power plant c. Connect starter ground wire d. Install propeller shaft, oil temperature wire, and transmission differential hoses e. Connect shifting linkages f. Connect accelerator pedal linkage and fuel shutoff g. Connect fuel hose h. Lower deck and grill assembly i. Install fan and drive belts j. Install radiator hoses and tubes k. Connect exhaust system l. Install air cleaner assembly and hose m. Fill cooling system n. Install bulkhead cables o. Connect battery ground lead p. Check oil levels in engine, transmission, and transfer gearcase

TASK	PERFORMANCE STEPS
3. REMOVE POWER PLANT TO DO OTHER TASK(S)	See Task Number 1
4. INSTALL POWER PLANT AFTER COMPLETING OTHER TASK(S)	See Task Number 2
5. REPLACE FUEL FILTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn off master switch c. Disconnect battery ground lead d. Close fuel flow valve e. Drain fuel f. Close drain valve g. Remove shell h. Discard element and gasket i. Install replacement element j. Fill shell with fuel k. Install shell with new gasket l. Connect battery lead and open fuel line m. Turn master switch on, start engine, and check for leaks
6. REPLACE MECHANICAL FUEL PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn off master switch c. Close fuel valve d. Remove generator drive belts e. Disconnect lower end of generator adjusting linkage f. Rotate generator upward g. Disconnect fuel hoses h. Remove fuel pump i. Install in reverse order
7. REPLACE FUEL PRESSURE SENDING UNIT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove leads to sending unit c. Remove sending unit d. Install in reverse order
8. REPLACE FUEL TANK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain fuel tank c. Lower ramp door d. Disconnect batteries e. Remove fuel filter neck f. Remove wiring harness guard g. Remove fuel line guard and ground strap h. Remove inboard shield and top retaining plate

TASK	PERFORMANCE STEPS
9. REPLACE FUEL SHUTOFF CONTROL	<ul style="list-style-type: none"> i. Remove fuel tank j. Install in reverse order a. Diagnose/verify fault b. Remove all engine access panels c. Remove fuel shutoff control d. Install replacement fuel shutoff control e. Check for proper adjustment f. Install panels
10. REPLACE HAND THROTTLE CONTROL	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove panel in driver's compartment c. Remove hand throttle control d. Install replacement throttle control e. Check for proper adjustment f. Install panel
11. REPLACE COOLING FAN TOWER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch off c. Drain cooling system d. Disconnect rectifier cable, if installed e. Disconnect exhaust pipe f. Remove radiator hoses and fan belts g. Raise engine deck assembly and secure h. Remove fan assemblies i. Replace washers, gaskets, and bushings j. Install in reverse order k. Torque mounting bolts to specifications
12. REPLACE RADIATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain cooling system c. Disconnect rectifier cables, if fitted d. Disconnect exhaust pipe e. Remove radiator vent hoses f. Remove fan belts g. Raise and secure engine deck assembly h. Remove radiator i. Install in reverse order j. Fill cooling system k. Check for leaks
13. REPLACE RADIATOR HOSE(S)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain cooling system c. Remove faulty hoses d. Install replacement hoses e. Fill cooling system f. Check for leaks

TASK	PERFORMANCE STEPS
14. REPLACE COOLANT PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain cooling system c. Remove exhaust pipe d. Remove coolant pump drive belts e. Remove coolant pump and gasket f. Install in reverse order g. Adjust pump drive belt h. Fill cooling system i. Check for leaks
15. REPLACE STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery cable c. Drain cooling system d. Disconnect radiator tubes e. Remove exhaust pipes f. Disconnect electrical leads g. Remove starter h. Install in reverse order
16. REPLACE STARTER SOLENOID	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn off master switch c. Disconnect battery ground lead d. Disconnect leads to solenoid e. Remove solenoid f. Install in reverse order
17. REPLACE GENERATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove generator drive belts c. Disconnect electrical cable d. Disconnect adjusting linkage e. Remove generator f. Install pulley on replacement generator g. Install generator in reverse order
18. REPLACE BELTS AND/OR PULLEYS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen belt adjustment c. Remove belt(s) d. Remove pulley as required e. Install replacement(s) in reverse order
19. ADJUST BELTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen locking nut c. Adjust tension d. Tighten locking nut

TASK	PERFORMANCE STEPS
20. TROUBLESHOOT ELECTRICAL SYSTEM	(Use multimeter to perform these steps) a. Test for continuity b. Test for short circuit c. Measure resistance d. Measure DC voltage e. Measure AC voltage
21. REPAIR WIRING	a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables
22. REPLACE SENDING UNITS OR GAGES	a. Diagnose/verify fault b. Turn master switch off c. Remove powerplant components as required (sending units) or swing out instrument panel (gages) d. Remove leads e. Remove sending unit or gage f. Install in reverse order
23. REPLACE BATTERIES, CABLES AND/OR CLAMPS	a. Diagnose/verify fault b. Disconnect leads c. Detach end clamps d. Loosen and rotate retainer e. Remove faulty parts f. Install in reverse order
24. REPLACE VOLTAGE REGULATOR	a. Diagnose/verify fault b. Remove voltage regulator c. Install replacement
25. ADJUST VOLTAGE REGULATOR	a. Start and run engine b. Connect voltmeter to battery terminals c. Adjust voltage

TASK	PERFORMANCE STEPS
26. ADJUST TRANSMISSION LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove driver's compartment engine access panel c. Place transmission in neutral d. Remove nuts/bolts on range selector link e. Adjust range selector link f. Check selector position g. Install link bolt and nut h. Install panel
27. REPLACE TRANSMISSION CROSS SHAFT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove engine compartment panel c. Remove accelerator, pedal link, shift link, and throttle valve link d. Remove power plant wiring harness e. Remove cross shaft to transmission f. Remove cross shaft throttle arm g. Remove transmission control outer cross shaft h. Install in reverse order
28. REPLACE OIL FILTER ELEMENT	<ul style="list-style-type: none"> a. Drain filter b. Detach filter case c. Discard element and gasket d. Install new element and gasket e. Attach filter case
29. REPLACE OIL COOLER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Drain oil d. Disconnect oil hoses from cooler e. Remove coolant pump belts f. Remove oil cooler housing g. Remove oil cooler core h. Install new or repaired core and/or housing in reverse order i. Fill with oil
30. REPLACE TRANSMISSION OIL COOLER HOSE AND FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove transmission oil cooler hoses d. Remove fittings from transmission e. Remove faulty parts f. Install in reverse order g. Check for leaks

TASK	PERFORMANCE STEPS
31. REPLACE FINAL DRIVE(S)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shroud c. Disconnect track and lift from sprocket d. Remove drive sprocket e. Remove right final drive U-joint and/or left final drive U-joint and propeller shaft f. Drain final drive g. Secure final drive lifting sling h. Remove final drive i. Fill final drive with oil and install in reverse order
32. ADJUST LATERALS (STEERING CONTROL)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lower trim vane c. Block tracks d. Disconnect oil inlet line (M577 only) e. Remove differential access plugs f. Release laterals g. Turn brake band adjusting nut h. Position steering lever in second notch i. Measure release pressure j. Adjust brake band nut k. Install access plugs l. Connect oil inlet line m. Check for leaks
33. REPLACE PIVOT STEER ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect housing yoke clevis pin c. Remove housing yoke clevis pin d. Remove screws from steering lever bracket e. Remove cross lever covers f. Remove nuts, washers, and screws from arm bearing g. Remove pivot steer assembly through bulkhead into drivers compartment h. Install in reverse order
34. REPLACE FIXED FIRE EXTINGUISHER CYLINDER	<ul style="list-style-type: none"> a. Remove discharge tube assembly from cylinder b. Remove control head from cylinder c. Loosen clamps and remove cylinder d. Install in reverse order

TASK	PERFORMANCE STEPS
35. REPLACE ROAD WHEEL ARM AND HUB	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shroud c. Loosen track tension d. Break track e. Position lifter under arm f. Remove road wheel hub g. Remove shock absorber as required h. Remove torsion bar using puller and adapter i. Remove arm assembly and packing j. Install arm and new packing in reverse order k. Adjust track tension
36. REPLACE ROAD WHEEL BEARINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shroud c. Remove road wheel hub d. Remove shock absorber as required e. Remove torsion bar f. Remove arm assembly and packing g. Remove housing h. Remove outer seal, inner seal, retainer gasket, and spacer i. Remove bearings j. Install in reverse order k. Lubricate housing
37. REPLACE IDLER ARM AND SPINDLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track shroud c. Break track d. Remove idler wheel and spindle e. Remove hub bearings and seal f. Remove track adjuster g. Tighten screws to specified torque h. Remove idler wheel arm assembly i. Install in reverse order j. Adjust track tension
38. REPLACE FINAL DRIVE U-JOINT(S)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove mounting bolts c. Lift out spider and propeller shafts d. Remove final drive U-joint e. Install in reverse order

TASK	PERFORMANCE STEPS
39. REPLACE EXHAUST GASKETS OR OTHER EXHAUST COMPONENTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise and secure powerplant door c. Disconnect exhaust pipe d. Remove flange from muffler e. Remove grill f. Remove muffler g. Install replacement parts in reverse order
40. REPLACE PERSONNEL HEATER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground lead c. Close heater fuel shutoff cock d. Remove flexible tube assembly e. Disconnect wiring harness f. Disconnect fuel hose g. Remove heater assembly h. Install in reverse order
41. REPLACE BILGE PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect circuit lead c. Remove strainer as required d. Disconnect hose e. Remove bilge pump f. Install in reverse order
42. REPLACE WATERTIGHT SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Pry up end of seal and pull seal from retaining groove c. Position replacement seal over retaining groove and push seal into place
43. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or aligning linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63N/T **FOR: TANK, M60A1**

TASK	PERFORMANCE STEPS
1. REMOVE DEFECTIVE/ INOPERATIVE POWERPACK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block tank front and rear c. Traverse turret 90 degrees to left or right d. Put transmission lever in park and turn off master switch e. Disconnect battery ground cables f. Remove back deck and transmission shroud g. Remove access plates h. Disconnect generator air duct i. Disconnect tachometer j. Disconnect power takeoff shaft k. Disconnect fuel lines l. Disconnect air cleaner hoses and fire extinguisher tubing m. Disconnect brake control rods, steering and shifting linkage n. Disconnect brake cylinder and lines o. Disconnect universal joint and final drive adapter p. Disconnect transmission mounting bracket q. Install sling and raise powerpack slightly r. Disconnect wiring harness s. Remove powerpack
2. GROUND HOP POWERPACK	<ul style="list-style-type: none"> a. Place powerpack on blocks in position near rear of hull b. Using ground hop kit, connect cable and hose assemblies c. Remove turbocharger hose assembly d. Position fabricated air cleaner assembly to turbocharger elbow e. Install fabricated tachometer assembly f. Connect battery ground cables g. Test powerpack operation h. Remove fabricated parts i. Disconnect ground hop kit
3. INSTALL REPAIRED POWERPACK	<ul style="list-style-type: none"> a. Install sling and position powerpack in well b. Connect wiring harness c. Lower powerpack and remove sling

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> d. Connect transmission mounting bracket e. Connect universal joint and final drive adapter f. Connect brake cylinder and lines g. Connect brake control rods, steering and shifting linkage h. Connect air cleaner hose and fire extinguisher tubing i. Connect fuel lines j. Connect power takeoff shaft k. Connect tachometer l. Connect generator air duct m. Install access plates n. Install back deck and transmission shroud o. Connect battery ground cables p. Test powerpack operation
4. REMOVE POWERPACK TO DO OTHER TASK(S)	See Task Number 1
5. INSTALL POWERPACK AFTER COMPLETING OTHER TASKS	See Task Number 3
6. REMOVE BACK DECK	<ul style="list-style-type: none"> a. Traverse turret 90 degrees to left or right b. Remove external handset box c. Open back deck grill doors d. Open rear exhaust grill doors e. Remove intake grill doors f. Traverse turret to gain access to deck bolts g. Remove deck bolts h. Install sling and remove deck
7. INSTALL BACK DECK	<ul style="list-style-type: none"> a. Traverse turret 90 degrees to left or right b. Install sling and position deck on hull c. Traverse turret to gain access to deck bolt holes d. Install deck bolts e. Mount intake grill doors f. Close top deck grill doors g. Close exhaust grill doors h. Install external handset box
8. REPLACE FUEL LINES AND/OR FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack c. Remove cooling fans

TASK	PERFORMANCE STEPS
9. REPLACE FUEL FILTERS	<ul style="list-style-type: none"> d. Remove engine access covers e. Remove fuel lines f. Replace unserviceable parts as required g. Install cooling fans h. Purge fuel system i. Ground hop and check for leaks j. Install engine access covers k. Install powerpack <ul style="list-style-type: none"> a. Remove powerpack b. Disconnect hoses from elbows c. Remove fuel filter d. Remove connector filter e. Remove elbows f. Install in reverse order
10. REPLACE OIL COOLER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack c. Drain engine oil cooler d. Disconnect oil lines e. Remove wiring harness and bracket f. Remove screen g. Remove oil cooler h. Install replacement oil cooler i. Ground-hop and check for leaks j. Install powerpack
11. REPLACE OIL FILTERS	<ul style="list-style-type: none"> a. Remove upper engine access cover b. Remove fire extinguisher line c. Drain engine oil d. Remove filter element cover e. Loosen screw and remove self-locking nuts and washers f. Remove filter cover and gasket g. Remove filter elements h. Install in reverse order, using new filter elements, gaskets, self-locking nuts and washers i. Fill with oil
12. REPLACE OIL COOLER LINES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove transmission shroud and back deck c. Remove line d. Install in reverse order

TASK	PERFORMANCE STEPS
13. ADJUST ACCELERATOR, THROTTLE CONTROLS AND/OR LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove upper engine access cover c. Open turret platform access door and position turret as required d. Adjust linkage and controls e. Start engine f. Adjust idle speed g. Stop engine h. Adjust accelerator i. Start engine j. Check adjustments k. Stop engine l. Install upper engine access cover
14. REPLACE ACCELERATOR, THROTTLE CONTROL, AND/OR LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pin c. Remove pin from connecting link d. Remove accelerator or linkage e. Install in reverse order
15. TROUBLESHOOT ELECTRICAL SYSTEM	<p>(Use multimeter to perform these steps)</p> <ul style="list-style-type: none"> a. Test for continuity b. Test for short circuit c. Measure resistance d. Measure DC voltage e. Measure AC voltage
16. REPAIR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables
17. REPLACE SENDING UNITS OR GAGES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack (sending units) or instrument panel (gages) c. Remove leads d. Remove sending unit or gage e. Apply insulating compound f. Install in reverse order

TASK	PERFORMANCE STEPS
18. REPLACE CIRCUIT BREAKERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Position main gun over right fender d. Open left back deck grill doors e. Disconnect engine accessory quick-disconnect f. Disconnect battery alternator quick-disconnect g. Close grill doors h. Open turret platform access door i. Traverse turret for access to circuit breaker j. Remove guards k. Remove leads to circuit breakers l. Remove mounting screws m. Remove circuit breakers n. Install in reverse order
19. REPLACE BATTERIES, CABLES, AND/OR CLAMPS	<ul style="list-style-type: none"> a. Traverse turret to expose batteries b. Set master battery switch to off c. Remove three battery ground cables and secure d. Slide protective boots from connector clamps (terminals) e. Remove six battery connector clamps from posts f. Remove holddown retainer g. Slide protective boots from positive clamps h. Remove positive clamps from posts i. Remove batteries j. Replace batteries, cables and/or clamps as required k. Install in reverse order
20. REPLACE VOLTAGE REGULATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Set master battery switch to off c. Disconnect battery ground cables and secure d. Disconnect electrical connectors e. Remove voltage regulator f. Install in reverse order
21. REPLACE STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack

TASK	PERFORMANCE STEPS
22. REPLACE GENERATOR AND/OR SEAL	<ul style="list-style-type: none"> c. Remove cable d. Remove starter e. Install replacement starter f. Ground hop to check starter operation g. Install powerpack <ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack c. Remove bus bars from terminals d. Disconnect electrical connectors e. Remove oil hoses (2c only) f. Remove V-band clamp g. Remove generator h. Remove tee and elbow i. Remove adapter and cradle j. Replace parts and seals as required k. Install in reverse order
23. REPLACE AIR CLEANER BLOWER MOTOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Set master battery switch to off c. Remove air cleaner cover d. Remove rubber bushing e. Disconnect electrical connectors f. Disconnect hose g. Remove blower motor h. Install in reverse order
24. REPLACE BLOWER MOTOR RELAY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Traverse turret to expose relay d. Open turret platform access door e. Disconnect electrical connector f. Remove relay g. Install in reverse order
25. REPLACE FAN TOWER SEAL	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove back deck c. Remove engine cooling fans d. Remove fan tower covers e. Remove fan tower f. Cut lacing wire g. Remove bolts h. Remove seal i. Install in reverse order

TASK	PERFORMANCE STEPS
26. ADJUST TRANSMISSION LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block vehicle front and rear c. Remove transmission shroud d. Remove back deck e. Remove screws f. Insert locating pins g. Adjust linkage h. Remove locating pins i. Insert screws and tighten j. Install back deck k. Install transmission shroud
27. REPLACE TRANSMISSION SHIFTING CONTROL ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Move connecting link aside c. Move parking brake control aside d. Move throttle locking lever aside e. Remove shifting control and bracket f. Tag all shims g. Replace parts as required h. Install in reverse order
28. REPLACE FINAL DRIVE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove back deck and transmission shroud c. Remove powerpack d. Remove rear fender e. Remove drain plug and drain oil f. Break track and remove from sprocket g. Disconnect final drive adapter h. Remove final drive i. Install in reverse order j. Fill with oil
29. REPLACE FINAL DRIVE SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerpack c. Remove adapter assembly from input shaft d. Pry seal out e. Install new seal f. Apply coat of oil to seal and adapter g. Install in reverse order
30. REPLACE MASTER OR SLAVE CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Place transmission shift in neutral c. Block tracks front and rear

TASK	PERFORMANCE STEPS
31. REPLACE MAIN BRAKE LINE	<ul style="list-style-type: none"> d. Remove powerpack (slave cylinder only) e. Disconnect connectors and tubes f. Drain fluid g. Remove cylinder h. Replace parts as required i. Install in reverse order j. Bleed brakes
32. BLEED BRAKE LINES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Place transmission shift lever in neutral c. Block tracks front and rear d. Remove transmission shroud e. Remove line f. Install in reverse order g. Bleed brakes
33. ADJUST BRAKES, CONTROLS, AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block tracks front and rear c. Place transmission lever in neutral d. Remove transmission shroud e. Connect filler and bleeder to master cylinder f. Open bleed valve on master cylinder g. Tighten valve when air and fluid flow stop h. Open bleed valve on slave cylinder i. Tighten valve when air and fluid flow stops j. Repeat steps h and i for other slave cylinder k. Remove filler and bleeder from master cylinder l. Place transmission lever in park m. Install transmission shroud

TASK	PERFORMANCE STEPS
34. REPLACE PARKING BRAKE CABLE	<ul style="list-style-type: none"> j. Fully apply brakes k. Check index marks l. Repeat procedure until index marks are alined m. Install cap, plugs, and covers n. Install transmission shroud
35. ADJUST SERVO BANDS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Place transmission lever in park c. Remove powerpack d. Remove cable clamp e. Remove brake housing cover f. Remove brake cable pin g. Remove cable h. Install in reverse order i. Adjust parking brake
36. ADJUST STEERING CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Place transmission lever in park c. Remove transmission shroud d. Remove lock plate e. Loosen locknut f. Torque adjusting nut g. Torque locknut h. Install lock plate i. Install transmission shroud
37. REPLACE FIXED FIRE EXTINGUISHERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Adjust track tension c. Block tracks front and rear d. Remove transmission shroud e. Adjust steering rod end bearings f. Remove fixed fire extinguisher control valve and cylinders g. Displace left ammo rack h. Remove powerpack, if necessary i. Adjust linkage j. Install in reverse order

TASK	PERFORMANCE STEPS
38. REPLACE FIXED FIRE EXTINGUISHER CONTROL VALVES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove connector and adapter c. Remove head from cylinder d. Remove control valves e. Remove lead seal f. Remove cover g. Remove sheave and cable h. Remove plugs i. Replace parts as required j. Install in reverse order
39. REPLACE ROAD WHEEL BEARINGS AND SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track or remove centerguide, if necessary c. Remove road wheel d. Remove cover plate and gasket e. Remove hub and bearing f. Remove bearing cups g. Replace bearings and cups as required h. Install in reverse order i. Adjust track tension
40. REPLACE SUPPORT ROLLER BEARINGS AND SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove support roller c. Remove bearing cups d. Replace bearings and cups as required e. Install in reverse order
41. REPLACE SHOCK ABSORBERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pins and mounting pins c. Remove shock absorber d. Install in reverse order
42. REPLACE SHOCK ABSORBER BUSHINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove shock absorber c. Cut off stakes d. Remove bushing e. Install in reverse order
43. REPLACE COMPENSATING IDLER WHEEL HUB AND ARM BEARING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track c. Remove track adjusting link d. Remove hub and arm assembly e. Remove inner bearing f. Remove outer bearing g. Replace bearing and cups as required h. Install in reverse order

TASK	PERFORMANCE STEPS
44. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63N **FOR: RECOVERY VEHICLE, M88A1**

TASK	PERFORMANCE STEPS
1. REMOVE DEFECTIVE/ INOPERATIVE POWER PLANT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove oxygen cylinder c. Remove engine deck d. Disconnect propeller shaft e. Disconnect transmission steering rod and transmission shifting rod f. Remove brake air valve linkage g. Disconnect transmission coupling h. Remove APU exhaust cover and muffler i. Remove APU cover j. Remove APU cooling air exhaust k. Remove personnel heater exhaust l. Remove APU housing m. Disconnect tachometer cable, generator air intake hose, and throttle linkage n. Disconnect emergency fuel shut off linkage o. Disconnect fuel lines p. Disconnect fire extinguisher line q. Remove side air ducts r. Loosen engine mount release rod s. Install sling and raise power plant slightly t. Install parts kit u. Disconnect wiring harness v. Remove power plant
2. GROUND HOP POWER PLANT	<ul style="list-style-type: none"> a. Place power plant on blocks in position near rear of hull b. Using ground hop kit, connect cable and hose assemblies c. Remove turbocharger hose assembly d. Position fabricated air cleaner assembly to turbocharger elbow e. Install fabricated tachometer assembly f. Connect battery ground cables g. Test power plant operation h. Remove fabricated parts i. Disconnect ground hop kit
3. INSTALL REPAIRED POWER PLANT	<ul style="list-style-type: none"> a. Install sling and position power plant in well b. Connect wiring harness c. Remove parts kit d. Lower powerplant and remove sling

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> e. Tighten engine mount release rod f. Install side air ducts g. Connect fire extinguisher line h. Connect fuel lines i. Connect emergency fuel shut off linkage j. Connect tachometer cable, generator air intake hose, and throttle linkage k. Install APU housing l. Install personnel heater exhaust m. Install APU cooling air exhaust n. Install APU cover o. Install APU exhaust cover and muffler p. Connect transmission coupling using new seals q. Install brake air valve linkage r. Connect transmission steering rod and transmission shifting rod s. Connect propeller shaft t. Install engine deck u. Install oxygen cylinder v. Test power plant operation
4. REMOVE POWER PLANT TO DO OTHER TASK(S)	See Task Number 1
5. INSTALL POWER PLANT AFTER COMPLETING OTHER TASK(S)	See Task Number 3
6. REMOVE BACK DECK	<ul style="list-style-type: none"> a. Raise boom b. Remove APU cooling air shield c. Remove personnel heater exhaust d. Open exhaust deflector door e. Remove exhaust elbows f. Open inside deck doors g. Release handle assemblies h. Turn slotted screws 90 degrees counter-clockwise i. Install sling and remove deck
7. INSTALL BACK DECK	<ul style="list-style-type: none"> a. Install sling and lower deck b. Turn slotted screws 90 degrees clockwise c. Secure handle assemblies d. Install exhaust elbows e. Close inside deck doors f. Close exhaust deflector door g. Install personnel heater exhaust h. Install APU cooling air shield i. Lower boom

TASK	PERFORMANCE STEPS
8. REPLACE OR REPAIR FRONT MOTOR MOUNT ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise and block engine c. Remove engine mounting bolts d. Remove shock mounts e. Remove saddle and engine mount assembly f. Install in reverse order
9. REPLACE FUEL LINES AND/OR FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove engine deck c. Remove engine right and left upper covers d. Remove engine cooling fans and engine cooling fan housing as required e. Remove fuel lines and/or fittings f. Install in reverse order
10. REPLACE FUEL FILTERS	<ul style="list-style-type: none"> a. Remove grille doors b. Turn master switch off c. Drain filter d. Remove filter head e. Remove and discard filter element f. Clean inside of filter body g. Install new filter element h. Attach constant bleed line i. Install filter head using new filter head gasket j. Activate electric fuel pump k. Bleed air from lines
11. REPAIR FUEL SHUTOFF CONTROL VALVE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove handwheel d. Remove collar, set screw, flat washer, seal, and bushing e. Install in reverse order
12. ADJUST ACCELERATOR, THROTTLE CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove deck grilles c. Disconnect linkage from engine throttle lever d. Insert locating pins in bracket and pedal e. Aline accelerator linkage as specified f. Remove locating pins g. Connect linkage to engine throttle lever h. Adjust throttle stop as specified i. Adjust accelerator connecting lever

TASK	PERFORMANCE STEPS
13. REPLACE ACCELERATOR, THROTTLE CONTROLS AND/OR LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove equipment as required to gain access to throttle and/or linkage components to be removed c. Remove faulty components d. Install in reverse order e. Adjust accelerator, throttle controls, and linkage as required
14. REPLACE OIL COOLER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Drain oil from cooler d. Remove oil lines e. Remove wiring harness and bracket f. Remove oil cooler screen g. Remove oil cooler h. Install in reverse order
15. REPLACE OIL FILTERS	<ul style="list-style-type: none"> a. Remove engine deck air inlet grilles b. Remove oil vent capscrew and seal washer c. Loosen oil drain valve plug d. Remove oil filter cover e. Remove and discard gasket and elements f. Clean filter body g. Install new filter elements, gasket, and seal washer in reverse order
16. REPLACE OIL LINES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove front grill doors or rear deck, as required c. Disconnect line and drain oil d. Remove oil lines and gaskets e. Install in reverse order
17. TROUBLESHOOT ELECTRICAL SYSTEM	<p>(Use multimeter to perform these steps)</p> <ul style="list-style-type: none"> a. Test for continuity b. Test for short circuit c. Measure resistance d. Measure DC voltage e. Measure AC voltage

TASK	PERFORMANCE STEPS
18. REPAIR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables
19. REPLACE SENDING UNITS OR GAGES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove deck grilles and floor plate as required (sending units) or instrument panel (gages) c. Remove leads d. Remove sending unit or gage e. Install in reverse order
20. REPLACE CIRCUIT BREAKERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect cable assembly c. Remove circuit breaker d. Install in reverse order
21. REPLACE BATTERIES, CABLES AND/OR CLAMPS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open grill doors c. Disconnect ground leads d. Disconnect positive leads e. Remove battery clamp, holddown brackets, and battery lead clamps as required f. Remove batteries as required g. Install in reverse order
22. REPLACE RPM (SPEED CONTROL) SOLENOID	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove front air intake grill doors c. Disconnect electrical connection d. Remove solenoid e. Install in reverse order f. Adjust solenoid speed adjusting screw to proper RPM
23. REPLACE VOLTAGE REGULATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove ground strap c. Disconnect electrical connections d. Remove voltage regulator e. Install in reverse order

TASK	PERFORMANCE STEPS
24. REPLACE MAIN ENGINE STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove starter module d. Disconnect starter module electrical connection e. Remove U-bolt f. Remove electrical cables g. Remove starter h. Install in reverse order
25. REPLACE STARTER RELAY AND HOUSING ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove powerplant c. Disconnect electrical lead to the starter relay d. Remove starter relay and housing e. Install in reverse order
26. REPLACE MAIN ENGINE GENERATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove air intake tube d. Remove U-bolt e. Remove electrical leads and ground strap f. Remove generator cable g. Remove generator h. Install in reverse order
27. REPLACE APU ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove exhaust cover c. Remove personnel heater exhaust d. Remove muffler e. Remove compartment housing and cover f. Remove air exhaust and intake g. Remove APU housing h. Disconnect electrical connectors i. Disconnect ground strap j. Disconnect hydraulic lines k. Disconnect fuel lines l. Remove APU assembly m. Install in reverse order

TASK	PERFORMANCE STEPS
28. REPLACE APU GENERATOR STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove APU assembly c. Remove APU support d. Loosen generator mounting nuts e. Disconnect electrical connectors f. Remove generator starter g. Install in reverse order
29. REPLACE APU FUEL PUMP AND/OR FILTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open grill doors c. Drain filters d. Remove fuel filter e. Remove drain plugs and transfer to new filter f. Install new filter g. Remove APU cover h. Disconnect fuel lines i. Remove fuel pump and gasket j. Install in reverse order k. Fill with oil
30. ADJUST TRANSMISSION LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open deck doors c. Remove batteries d. Block tracks front and rear e. Disconnect shifting rods f. Loosen locknuts and insert locating pins g. Adjust linkage h. Tighten all locknuts and remove locating pins
31. REPLACE TRANSMISSION SHIFTING CONTROL	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect electrical leads c. Disconnect linkage d. Remove screws from base e. Remove assembly f. Install in reverse order g. Adjust linkage
32. REPLACE OR REPAIR HYDRAULIC LINES AND FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove line or fitting c. Install line or fitting

TASK	PERFORMANCE STEPS
33. REPLACE FINAL DRIVE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove track drive hub and sprockets d. Remove drive coupling e. Remove alinement ring (right drive only) f. Disconnect brake rod g. Support drive and remove bolts h. Install jackscrews and move drive out slightly i. Install lifting sling j. Remove drive k. Install in reverse order
34. REPLACE FINAL DRIVE SEALS (O RINGS)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise power plant until transmission clears final drive c. Remove seals (O rings) d. Install in reverse order
35. ADJUST BRAKES, CONTROLS AND/OR LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Place shift control lever in park position c. Block tracks front and rear d. Release brakes e. Open deck doors f. Insert pin g. Adjust cam rod h. Adjust right lever rod i. Adjust interconnecting rods j. Adjust bellcrank linkage rods k. Adjust brake shaft cover linkage rods l. Tighten locknuts and remove pin
36. ADJUST STEERING CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open deck doors c. Check transmission oil pressure d. Disconnect rear steering rod from transmission e. Remove batteries f. Insert locating pins and adjust upper steering control

TASK	PERFORMANCE STEPS
37. REPLACE FIXED FIRE EXTINGUISHERS	<ul style="list-style-type: none"> g. Insert locating pins and adjust lower steering control tube and linkage h. Adjust rear steering rod i. Tighten all locknuts and remove locating pins <ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove control valves c. Disconnect discharge lines d. Release straps and remove cylinders e. Install in reverse order
38. ADJUST/RESET FIXED FIRE EXTINGUISHER HEADS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect interconnecting CO₂ lines c. Remove connector head assemblies d. Remove cylinder control valve e. Remove cover assembly f. Remove control cable pulley g. Remove cable reel h. Disconnect cable i. Install in reverse order
39. REPLACE TRACK ADJUSTING ARM (COMPENSATING-IDLER WHEEL ARM)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track c. Remove compensating idler wheel disks d. Disconnect compensating idler link e. Remove compensating idler wheel arm f. Install in reverse order
40. ADJUST TRACK TENSION	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Center track shoe over No. 2 support roller c. Pry up and block track d. Loosen track adjusting link lock screw e. Adjust track tension f. Tighten lock screw and remove block
41. REPLACE TRACK ASSEMBLY OR TRACK BLOCK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Partially remove end connectors d. Position track jacks and tighten e. Remove end connectors f. Remove track jacks

TASK	PERFORMANCE STEPS
42. REPLACE END CONNECTORS AND/OR CENTER GUIDES	<ul style="list-style-type: none"> d. Remove tapered plug and sleeve e. Remove winch cover and cable guide g. Remove center guide h. To replace track block, remove additional end connectors and center guide i. To remove entire track, back tank up until old track is off j. Install new track or track block in reverse order k. Adjust track tension <ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Partially remove end connectors d. Position track jacks and tighten e. Remove end connectors f. Loosen centerguide nut g. Loosen track jacks h. Remove centerguide i. Install replacements in reverse order
43. REPLACE ROAD WHEEL OR BEARINGS AND SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track or remove center guide, as required c. Remove road wheel d. Remove hub, seal, and bearings as required e. Install in reverse order
44. REPLACE ROAD WHEEL ARM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Break track as required c. Remove road wheels d. Remove torsion bar e. Disconnect shock absorber and/or compensating idler link as required f. Remove road wheel arm g. Install in reverse order
45. REPLACE SUPPORT ROLLER OR BEARINGS AND SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove hub as required c. Remove track shoe guides d. Position and raise track

TASK	PERFORMANCE STEPS
46. REPLACE SHOCK ABSORBERS AND/OR BUSHINGS	<ul style="list-style-type: none"> e. Remove support roller f. Remove bearings and seals as required g. Install in reverse order <ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pin and straight pin c. Remove shock absorber d. Remove bushing e. Install in reverse order
47. REPLACE DRIVE SPROCKET	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove mud guard c. Disconnect and remove track d. Remove nuts and dowels e. Install lifting sling f. Remove hub and sprocket assembly g. Remove drive sprocket h. Install in reverse order i. Adjust track tension
48. REPLACE OR REPAIR HOIST CABLES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Pay out cable c. Remove cable clevis f. Remove roller g. Remove pins h. Replace or repair cable i. Install in reverse order
49. REPLACE OR REPAIR WINCH CABLES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Pay out cable c. Remove cable clevis d. Remove tapered plug and sleeve e. Remove winch cover and cable guide f. Remove level winder g. Remove roller h. Remove pins i. Replace or repair cable j. Install in reverse order

TASK	PERFORMANCE STEPS
50. REPLACE SPADE RELEASE CABLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open floor plate and remove stowage baskets c. Disconnect cable connector d. Remove control handle e. Remove pulleys f. Remove lever g. Remove cable h. Replace in reverse order
51. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63T **FOR: Recovery Vehicle, M578**

TASK	PERFORMANCE STEPS
1. REMOVE DEFECTIVE/ INOPERATIVE POWER PLANT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block vehicle front and rear c. Put transmission lever in netrual and turn off master switch d. Traverse cab 90 degrees e. Disconnect battery ground cables f. Remove access plates g. Remove engine mount screw h. Remove air intake duct and hoses i. Disconnect power takeoff and drive shaft j. Disconnect cooling system hoses k. Disconnect engine shutdown cable l. Disconnect steering control rod m. Disconnect throttle control rod n. Disconnect brake control shaft o. Disconnect electrical connectors p. Disconnect speedometer and tachometer cables q. Disconnect final drive adapter r. Install sling and raise power plant s. Remove powerpack
2. INSTALL REPAIRED POWER PLANT	<ul style="list-style-type: none"> a. Install sling and position powerpack in well b. Lower power pack and remove sling c. Connect final drive adapter d. Connect speedometer and tachometer cables e. Connect electrical connectors f. Connect brake control shaft g. Connect throttle control rod h. Connect steering control rod i. Connect engine shutdown cable j. Connect cooling system hoses k. Connect power takeoff and drive shaft l. Install air intake duct and hoses m. Install engine mount screw n. Install access plates o. Connect battery ground cables p. Test power plant operation

TASK	PERFORMANCE STEPS
3. REMOVE POWER PLANT TO DO OTHER TASK(S)	See Task 1
4. INSTALL POWER PLANT AFTER COMPLETING OTHER TASK(S)	See Task 2
5. REPLACE AIR CLEANER BLOWER ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch to off c. Remove blower motor cover d. Disconnect electrical connectors e. Remove hoses f. Remove blower g. Remove gasket h. Install in reverse order
6. REPLACE FUEL FILTERS	<ul style="list-style-type: none"> a. Remove filter access door b. Disconnect hose c. Drain fuel d. Remove shell e. Remove and discard gasket and filter element f. Install in reverse order
7. REPLACE FUEL LOW PRESSURE LINES AND FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect hoses at quick-disconnect c. Remove fittings d. Replace/repair lines and fittings e. Install in reverse order
8. REPLACE OIL FILTERS	<ul style="list-style-type: none"> a. Remove transmission deck b. Drain oil c. Disconnect hoses d. Remove filter assembly e. Install in reverse order
9. REPLACE RADIATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove upper mount c. Remove plugs and pre-formed packing d. Remove drain cock e. Remove crossover tube and gasket f. Remove hoses g. Remove radiator h. Install in reverse order

TASK	PERFORMANCE STEPS
10. REPLACE WATER HOSES AND PIPES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove engine deck c. Drain cooling system d. Disconnect hoses e. Remove power plant, if required f. Remove hoses g. Install in reverse order
11. REPLACE FAN	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove air intake grill c. Remove fan belts d. Remove mounting bolts e. Remove fan f. Install in reverse order
12. REPLACE FAN BELTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove fan well deck c. Release fan belt tension d. Disconnect electrical connector e. Remove magnetic clutch link f. Disconnect drive shaft g. Remove belts h. Install in reverse order
13. TROUBLESHOOT ELECTRICAL SYSTEM	<p>(Use multimeter to perform these steps)</p> <ul style="list-style-type: none"> a. Test for continuity b. Test for short circuit c. Measure resistance d. Measure DC voltage e. Measure AC voltage
14. REPAIR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables
15. REPLACE SENDING UNITS OR GAGES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant (sending units) or instrument panel (gages)

TASK	PERFORMANCE STEPS
16. REPLACE BATTERIES, CABLES AND/OR CLAMPS	<ul style="list-style-type: none"> c. Remove leads d. Remove sending unit or gage e. Apply insulating compound f. Install in reverse order <ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch to off c. Open access door and remove cover d. Remove ground leads and terminals e. Remove hold-down channel f. Remove batteries g. Replace batteries, cables and/or clamps as required h. Install in reverse order
17. REPLACE VOLTAGE REGULATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Turn master switch to off c. Remove left CO2 access cover d. Disconnect electrical connectors e. Remove voltage regulator f. Install in reverse order
18. REPLACE GENERATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove electrical leads d. Remove hose e. Remove generator and scroll housing f. Remove gasket g. Remove scroll housing h. Install in reverse order
19. REPLACE FINAL DRIVE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove power plant c. Remove track d. Remove fender extension e. Remove drive sprocket nut f. Remove headlight guard g. Remove bolts h. Attach sling i. Remove final drive j. Install in reverse order
20. ADJUST SHIFTING CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Remove transmission deck b. Loosen shift linkage rod end c. Position shift control lever in position 1 d. Loosen stud rod end e. Adjust stud rod f. Tighten and check adjustment

TASK	PERFORMANCE STEPS
21. ADJUST MECHANICAL BRAKE CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Remove engine and transmission decks b. Adjust brake cable c. Fully release brakes d. Check index pin alignment e. Fully apply brakes f. Check index pin position g. Remove inspection covers h. Rotate brake adjusting nut i. Install covers and decks
22. REPLACE FIXED FIRE EXTINGUISHERS	<ul style="list-style-type: none"> a. Traverse cab to expose left access cover b. Remove left CO2 cylinder access cover c. Insert safety pin in control valve handle d. Disconnect tube to control valve e. Remove control valve f. Remove cylinder g. Repeat process for right cylinder h. Install in reverse order
23. REPLACE ROAD WHEEL ARM AND HUB	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track c. Remove road wheel d. Remove torsion bar e. Drain lubricant f. Remove hub g. Remove lockout cylinder h. Remove road wheel arm i. Remove lockout cylinder lever arm j. Install in reverse order
24. REPLACE ROAD WHEEL	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track tension c. Loosen road wheel nuts d. Position wheel over wood block e. Place lockout valve in locked position f. Move wheel off block g. Jack up track h. Remove road wheel i. Install in reverse order

TASK	PERFORMANCE STEPS
25. REPLACE IDLER ARM AND HUB	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track c. Remove idler wheel d. Drain lubricant e. Remove idler wheel hub f. Remove eccentric spindle g. Remove torsion bar h. Remove idler arm flange bolts i. Remove lockout cylinder j. Remove idler arm k. Install in reverse order
26. REPLACE DRIVE SPROCKET HUB	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove track c. Remove hub nuts and bushings d. Remove hub e. Remove sprockets from hub f. Install in reverse order
27. ADJUST TRACK TENSION	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen track adjusting locking bolts c. Insert wedge d. Move track forward until hole in road wheel is in line with hole in spindle e. Insert track adjusting bar f. Move track until proper adjustment is obtained g. Remove wedge h. Tighten locking nuts to 1,200 ft lbs
28. REPLACE TRACK ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Relieve track tension c. Break track d. Tow vehicle backward to remove track e. Install in reverse order f. Adjust track tension
29. REPLACE TRACK SHOES (PADS)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove nut c. Remove track shoe d. Install in reverse order

TASK	PERFORMANCE STEPS
30. ADJUST STEERING CONTROL AND LINKAGE	<ul style="list-style-type: none"> a. Remove transmission deck b. Position steering bar in no steer position c. Position steering shaft cover in detent d. Loosen steering rod end locking nut e. Adjust steering linkage f. Tighten locking nut
31. REPLACE LOCKOUT CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Position lockout valve in unlocked position c. Disconnect hoses d. Attach sling and remove lockout cylinder e. Install in reverse order
32. REPLACE BOOM CABLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Pay out boom cable until cable is free from winch drum c. Remove cable from boom assembly d. Install in reverse order
33. REPLACE BOOM HYDRAULIC CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Close cylinder valve c. Disconnect oil lines to cylinder d. Loosen upper and lower mounting pins e. Lift boom f. Remove pins g. Remove cylinder h. Install in reverse order
34. REPLACE HYDRAULIC LINES AND FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Relieve pressure in lines c. Remove panels or floor plates d. Remove line or fitting e. Install line or fitting
35. REPLACE PERSONNEL HEATER ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove mounting clamps c. Disconnect exhaust coupling d. Disconnect electrical cable e. Remove heater from cab f. Drain fuel

TASK	PERFORMANCE STEPS
39. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS	<ul style="list-style-type: none"> g. Remove fuel tank and fuel lines from heater h. Remove air outlet from heater i. Install in reverse order <p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63B/N/S/T **FOR: TRUCK, UTILITY, M151**

TASK	PERFORMANCE STEPS
1. ADJUST VALVES	<ul style="list-style-type: none"> a. Warm up engine b. Remove rocker arm cover c. With engine operating at idle speed, adjust valves d. Install rocker arm cover
2. ADJUST CLUTCH PEDAL FREE TRAVEL	<ul style="list-style-type: none"> a. Remove clutch return spring b. Slip rod out of clutch release lever c. Rotate the rod until pedal free travel is obtained d. Depress clutch pedal and check free travel e. Repeat steps c and d as required f. Install in reverse order
3. REPLACE CLUTCH PRESSURE PLATE AND THROWOUT BEARING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove pressure plate and driven disk c. Aline clutch disk with pilot bearing d. Install pressure plate
4. REPLACE CARBURETOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure hood c. Disconnect vent tube fitting d. Remove air intake hose e. Disconnect fuel hoses f. Disconnect choke control cable g. Disconnect throttle linkage h. Remove retracting spring i. Remove accelerator retracting spring bracket j. Remove carburetor k. Install in reverse order
5. REPLACE FUEL LINES AND VENT TUBES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure hood c. Disconnect both ends of line/tube d. Remove line/tube e. Install in reverse order

TASK	PERFORMANCE STEPS
6. REPLACE FUEL FILTER	<ul style="list-style-type: none"> a. Remove hose clamp b. Unscrew filter from carburetor c. Install in reverse order
7. REPLACE FUEL PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure hood c. Disconnect fuel hoses d. Remove pump and gasket e. Install in reverse order
8. REPLACE FUEL TANK	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground strap c. Remove driver's seat d. Drain fuel tank e. Disconnect electrical connector f. Disconnect fuel and vent lines g. Remove tank h. Install in reverse order
9. REPLACE EXHAUST GASKETS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove clamps securing pipes c. Slide pipes apart d. Remove old gasket e. Install new gasket f. Reseat pipes and install clamps g. Check for leaks
10. REPLACE MUFFLER AND/OR TAIL PIPES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lift vehicle c. Disconnect front U-joint of rear propeller shaft d. Remove clamps e. Remove muffler/tail pipe f. Install in reverse order
11. REPLACE RADIATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain cooling system c. Remove hoses d. Remove upper support assembly e. Remove radiator f. Install in reverse order
12. REPLACE COOLANT HOSES AND CLAMPS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain cooling system c. Loosen clamps d. Remove hose e. Install in reverse order

TASK	PERFORMANCE STEPS
13. REPLACE BELTS AND/OR PULLEYS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen generator bottom mounting bolts c. Loosen generator adjusting arm bolt d. Move generator toward engine and remove belt e. Remove pulley f. Install in reverse order g. Adjust belts
14. ADJUST BELTS	<ul style="list-style-type: none"> a. Loosen generator adjusting arm and mounting bolts b. Place straight edge on the belts at water pump and generator pulleys c. Insert pry bar and move generator until adjustment is obtained d. Tighten generator adjusting arm and mounting bolts
15. REPLACE GENERATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove battery ground cable c. Remove air cleaner assembly d. Remove drive belts e. Remove electrical cable f. Remove generator g. Install in reverse order
16. REPLACE STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove front seats c. Remove battery cover d. Remove battery ground cable e. Remove transmission cover plate f. Remove starter cable g. Remove starter and gasket h. Install in reverse order
17. REPLACE IGNITION DISTRIBUTOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect cables c. Remove vent hoses d. Remove distributor e. Remove all fittings from old distributor f. Install in reverse order g. Adjust timing

TASK	PERFORMANCE STEPS
18. REPLACE CAPACITOR, ROTOR, CONTACT POINTS AND/OR SPARK PLUGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect cables c. Remove distributor caps d. Remove rotor e. Remove capacitor leads f. Remove contact points g. Remove spark plugs h. Install in reverse order i. Adjust contact points j. Adjust timing
19. ADJUST CONTACT POINTS	<ul style="list-style-type: none"> a. Remove distributor cap b. Crank the engine until the rubbing block is on a cam peak c. Loosen stationary breaker point mounting screw d. Adjust point gap e. Tighten mounting screw f. Check point gap g. Install distributor cap
20. ADJUST IGNITION TIMING	<ul style="list-style-type: none"> a. Mark timing mark and pointer on crankshaft pulley b. Connect engine timing light adaptor to number one spark plug c. Connect timing light to the batteries and number one spark plug adaptor d. Start engine and idle at 450-500 RPM e. Loosen distributor adjusting screw f. With engine idling, direct timing light at timing pointer on timing gear cover g. Rotate distributor until timing mark on pulley is in line with pointer h. Tighten distributor adjusting screw i. Check adjustment
21. REPAIR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables

TASK	PERFORMANCE STEPS
22. REPLACE BATTERIES, CABLES AND/OR CLAMPS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove passenger seat and battery cover c. Remove battery cables d. Remove hold-down frames e. Remove batteries f. Remove cable clamps g. Replace batteries, cables or clamps as required h. Install in reverse order
23. REPLACE CIRCUIT BREAKERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove instrument cluster c. Disconnect speedometer cable d. Remove electrical connectors e. Remove circuit breaker f. Install in reverse order
24. REPLACE LIGHT BULBS AND WIRES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove lamp retainer and/or cover c. Remove light bulb d. Install new light bulb e. Check for proper operation f. Check wires with multimeter g. Repair or replace h. Install light cover and/or retainer
25. REPLACE SENDING UNITS OR GAGES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove instrument cluster c. Remove electrical connectors d. Remove gage e. Open engine compartment cover f. Disconnect electrical lead to sending unit g. Remove sending unit h. Install in reverse order
26. REPLACE UNIVERSAL JOINTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove propeller shaft c. Remove ends and grease fitting from cross shaft d. Remove snap rings from yoke e. Press cross shaft races from yoke f. Remove U-joint g. Install in reverse order

TASK	PERFORMANCE STEPS
27. REPLACE DIFFERENTIAL, FRONT OR REAR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove U-bolts securing axle shafts c. Remove screws securing propeller shaft to differential d. Remove brush guard (front only) e. Remove differential f. Install in reverse order
28. REPLACE DIFFERENTIAL SEAL	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect propeller shaft and/or drive shaft c. Remove flange d. Pry retainer and seal assembly from differential e. Install in reverse order
29. REPLACE TRANSMISSION SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect propeller shaft c. Drain transmission d. Remove transmission flange e. Remove silicone from flange f. Remove seal from retainer g. Remove sleeve from flange h. Install in reverse order
30. REPLACE SLEEVE, SHAFT AND CROSS WHEEL DRIVE SEALS, FLANGE AND SPINDLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove lifting eye c. Remove wheel d. Remove brake drum from spindle e. Remove spindle from flange f. Disconnect axle U-joint from axle flange g. Move wheel drive shaft aside and pull wheel drive flange from support h. Pry outer seal and retainer from support i. Pry inner seal off support assembly j. Remove sleeves from spindle and flange k. Install in reverse order
31. REPLACE WHEEL BEARING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove lifting eye c. Remove wheel d. Remove brake drum from spindle e. Remove spindle from flange f. Disconnect axle U-joint from axle flange

TASK	PERFORMANCE STEPS
32. ADJUST WHEEL BEARINGS	<ul style="list-style-type: none"> g. Move wheel drive shaft aside and pull wheel drive flange from support h. Pry outer seal and retainer from support i. Pry inner seal off support assembly j. Remove bearings cups from support k. Remove bearing from spindle l. Lubricate new bearings m. Install in reverse order n. Adjust wheel bearings <ul style="list-style-type: none"> a. Remove wheel and tire assembly b. Remove lifting eye c. Remove cotter pin from wheel drive flange d. Tighten drive flange nut e. Rotate spindle three complete turns f. Recheck nut tightness g. Back nut off one complete rotation without rotating spindle h. Tighten nut finger tight i. Install in reverse order
33. ADJUST SERVICE BRAKES	<ul style="list-style-type: none"> a. Jack up wheel until tire clears ground b. Pry cover from adjusting hole in backing plate c. Engage star wheel of adjusting screw assembly d. Rotate wheel and adjusting screw until wheel can not be rotated e. Back adjusting screw off eleven clicks f. Install adjusting hole cover g. Repeat on remaining wheels h. Check brake fluid level in master cylinder
34. ADJUST PARKING BRAKES	<ul style="list-style-type: none"> a. Remove transmission tunnel cover b. Release parking brake tension c. Turn adjusting knob fully counter-clockwise d. Loosen jam nuts on band aligning screws e. Adjust screws alternatively to proper clearance f. Tighten jam nuts g. Place vehicle on incline and test parking brake h. Set wear adjustment knob

TASK	PERFORMANCE STEPS
35. REPLACE SERVICE BRAKES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove brake drum d. Remove spring from anchor e. Remove shoe retracting springs f. Remove brake shoes g. Remove adjusting screw assembly and spring from brake shoe h. Install in reverse order i. Adjust brakes
36. REPLACE SERVICE BRAKE LINES AND HOSES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Unscrew hydraulic line connector fitting c. Slip clip off hose fitting d. Pull hose out of bracket e. Disconnect opposite end of line f. Install in reverse order
37. REPLACE MASTER CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Separate the connector at stoplight switch c. Disconnect brake line fitting from master cylinder d. Remove flat nut and workers securing clutch lever to pedal shaft e. Remove two bolts securing master cylinder bracket to bracket on firewall f. Remove four bolts securing master cylinder, bracket and pedal assembly to fire wall g. Remove assembly h. Remove adjusting eccentric bolt i. Remove two bolts securing master cylinder to bracket j. Install in reverse order k. Fill master cylinder and bleed brakes
38. REPLACE WHEEL CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove brake drum d. Disconnect hydraulic brake line from wheel cylinder e. Remove brake shoe assembly f. Remove cylinder g. Install in reverse order

TASK	PERFORMANCE STEPS
39. REPLACE PARKING BRAKES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove transmission cover plate c. Remove retracting springs (early models only) d. Remove band-alining screw support assembly e. Remove band adjusting nut f. Withdraw band and lining from brake drum g. Install in reverse order h. Adjust brakes
40. ADJUST TOE-IN	<ul style="list-style-type: none"> a. Rotate steering wheel to stop b. Reverse steering wheel until one spoke is at the bottom c. Loosen clamps on spindle arm adjusting sleeves d. Place wheel alinement toe-in gage between tires ahead of vertical centerline of wheels e. Position the gage so both chains just touch the floor f. Move the gage scale to read zero g. Push vehicle forward until gage is behind vertical centerline and chains just touch floor h. Read gage i. Remove gage and turn both adjusting sleeves equally j. Repeat toe-in check until correct adjustment is obtained k. Tighten clamps
41. REPLACE UPPER AND LOWER BALL JOINTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise vehicle c. Remove ball joints d. Install in reverse order
42. REPLACE UPPER AND LOWER SUSPENSION ARMS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel assembly c. Disconnect upper or lower end of shock absorber d. Remove arms e. Install in reverse order

TASK	PERFORMANCE STEPS
43. REPLACE SPRINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise vehicle and position support under lower arm c. Disconnect lower end of shock absorber d. Disconnect drive shaft e. Remove wheel assembly if required f. Remove lower ball joint g. Lower suspension arm and remove spring h. Install in reverse order
44. REPLACE SHOCK ABSORBERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Raise vehicle and support lower suspension arm c. Remove shock absorber d. Install mounting hardware on new shock e. Install in reverse order
45. REPLACE FRONT SHOCK BUSHINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove shock absorber c. Remove bushings d. Install in reverse order
46. REPLACE OR REPAIR TIRE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove valve stem from inner tube stem d. Remove inner tube from tire e. Remove tire from wheel f. Repair inner tube or tire as required g. Install in reverse order
47. REPLACE WINDSHIELD WIPER MOTOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove both wiper arms and blades c. Remove connecting link d. Disconnect electrical connection e. Remove wiper motor from windshield f. Install in reverse order
48. REPLACE WINDSHIELD WIPER ARM AND/OR BLADE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Lift wiper arm away from windshield c. Pry arm from pivot shaft d. Remove blade e. Install in reverse order

TASK	PERFORMANCE STEPS
49. REPLACE WINDSHIELD	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect electrical connector and remove cable clamp c. Remove windshield d. Remove windshield wiper motor if required e. Install in reverse order
50. REPLACE PERSONNEL HEATER ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Close both shutoff cocks in engine compartment c. Disconnect blower motor cable from circuit breaker d. Disconnect hoses from heater core e. Remove heater f. Install in reverse order
51. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63B/N/S/T **FOR: TRUCK, M35A2/M54**

TASK	PERFORMANCE STEPS
1. ADJUST CLUTCH CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Loosen nut adjacent to clevis b. Remove clevis from throwout shaft lever c. Adjust length of rod d. Check free pedal travel e. Install in reverse order f. Tighten nut against clevis g. Recheck free pedal travel
2. REPLACE CLUTCH CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove accelerator linkage c. Remove clutch return spring d. Remove brake return spring e. Disconnect pedal shift f. Remove pedal lever g. Remove control rod h. Disconnect clutch throwout lever from throwout shaft i. Remove control lever j. Remove pedal lever shaft k. Disconnect clutch throwout lever from clevis l. Disconnect clevis and rod m. Install in reverse order n. Adjust free pedal travel
3. REPLACE ELECTRICAL INTAKE FUEL PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect cable connector c. Disconnect fuel lines d. Remove fuel pump e. Install in reverse order
4. TIGHTEN FUEL LINES AND FITTINGS	<ul style="list-style-type: none"> a. Tighten tube nuts into fitting b. Start engine c. Check for leaks
5. ADJUST/REPLACE ACCLERATOR CONTROLS AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove throttle return spring c. Disconnect throttle control wire d. Remove accelerator linkage assembly e. Remove lever assembly f. Remove control pedal and connecting link

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> g. Remove control bracket h. Install in reverse order i. Disconnect ball joint from lever assembly j. Adjust throttle by shortening/lengthening rod k. Connect balljoint to lever assembly
6. REPLACE FUEL OR OIL FILTERS	<ul style="list-style-type: none"> a. Remove drain plug/open drain cock b. Drain fluid c. Remove filter d. Remove gasket e. Install in reverse order f. Bleed fuel system (fuel filter replacement)
7. REPLACE EXHAUST GASKETS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove locknuts and bolts c. Separate components d. Remove gasket e. Install in reverse order
8. REPLACE AIR CLEANER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove rain shield hood c. Remove retaining hardware d. Remove air cleaner e. Install in reverse order
9. REPLACE RADIATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove front brush guard c. Drain coolant d. Remove hoses e. Remove stay rod f. Remove lower mounting bolts and springs g. Remove radiator h. Install in reverse order i. Fill with coolant
10. REPLACE RADIATOR HOSES AND CLAMPS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain coolant, if required c. Remove hose and clamps d. Install in reverse order e. Fill with coolant
11. REPLACE WATER PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain coolant c. Remove radiator

TASK	PERFORMANCE STEPS
12. ADJUST FAN BELT	<ul style="list-style-type: none"> d. Remove fan from pump shaft e. Remove pump mounting nuts f. Remove water pump g. Install in reverse order h. Fill with coolant <ul style="list-style-type: none"> a. Loosen generator adjusting arm b. Insert 30-inch bar between generator and crankcase c. Pull bar with 50 pounds of force d. Tighten generator adjusting arm e. Remove bar f. Check amount of belt free play
13. REPLACE FAN BELT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen generator adjusting arm c. Remove fan belt d. Install in reverse order e. Adjust fan belt
14. REPLACE STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cable c. Remove intake air cleaner d. Remove electrical cables from starter e. Remove starter f. Remove gaskets g. Inspect ring gear for damage h. Install in reverse order
15. REPLACE BATTERY, CABLES AND/OR CLAMPS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Pull battery box onto running board c. Remove clamp from ground (negative) terminal and secure d. Remove clamp from positive terminal e. Remove jumper cable clamps from terminals f. Remove battery retainers g. Remove batteries h. Replace battery, cables, and/or clamps as required i. Install in reverse order

TASK	PERFORMANCE STEPS
16. REPLACE 25 AMP VOLTAGE REGULATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Insure ignition switch is in off position c. Disconnect electrical connectors d. Remove voltage regulator e. Install in reverse order
17. REPLACE GENERATOR/ALTERNATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove electrical lead c. Remove adjusting arm bolt d. Remove drive belts e. Remove generator/alternator f. Install in reverse order g. Adjust drive belts
18. REPLACE LIGHTS AND SWITCHES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen/remove bracket/switch plate c. Disconnect connectors d. Remove light or switch e. Install in reverse order
19. REPLACE SENDING UNITS OR GAGES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cable and secure c. Remove connectors or leads d. Remove sending unit or gage e. Install in reverse order
20. REPAIR WIRING/CABLES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cable and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables
21. REPLACE HORN AND/OR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Insure ignition switch is in off position c. Remove mounting screws d. Disconnect connectors

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> e. Remove horn assembly f. Remove horn button g. Remove horn wire from steering column h. Install in reverse order
22. REPLACE EMERGENCY WARNING BUZZER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect connectors c. Remove warning buzzer unit d. Install in reverse order
23. REPLACE UNIVERSAL JOINT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove propeller shaft/universal joints c. Remove retaining rings d. Remove grease fitting e. Remove bearings f. Remove spider from yoke g. Install in reverse order
24. ADJUST SERVICE BRAKES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove axle d. Check wheel bearing adjustment e. Turn front adjusting cam f. Turn rear adjusting cam g. Install in reverse order
25. REPLACE HAND BRAKE SHOES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove shoe return springs c. Disconnect the hand brake cable from lever d. Remove jam nut and anchor bolt from lower end of shoe bar e. Slide shoe assembly from brake drum f. Remove shoes from lever pins g. Install in reverse order
26. REPLACE SERVICE BRAKE SHOE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove hub and brake drum d. Remove spring e. Remove retaining rings and nuts for guide pins

TASK	PERFORMANCE STEPS
27. REPLACE MASTER CYLINDER	<ul style="list-style-type: none"> f. Remove brake shoe g. Remove anti-rattle springs, retaining rings, guidepins, and washers h. Install in reverse order i. Adjust brakes <ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect hydraulic and breather lines c. Remove power-takeoff shift lever bracket d. Disconnect linkage e. Remove master cylinder f. Install in reverse order g. Fill and bleed system h. Connect breather line
28. REPLACE WHEEL CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove brake drum d. Remove wheel cylinder e. Install in reverse order f. Bleed system g. Adjust brakes
29. REPLACE BRAKE LINES, FITTINGS, OR HOSE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Tag lines for correct replacement c. Remove tube nuts from fittings/connectors d. Drain brake fluid e. Remove clamps/brackets f. Remove line/hose g. Remove fitting h. Install in reverse order i. Fill and bleed system
30. REPLACE HYDRAULIC CYLINDER (HYDROVAC)	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Drain air system c. Remove cylinder shield d. Disconnect air and hydraulic lines e. Disconnect stoplight cable f. Remove cylinder g. Install in reverse order

TASK	PERFORMANCE STEPS
31. REPAIR AIR SYSTEM LINES AND FITTINGS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen and remove connecting nut c. Remove tube/line d. Remove fitting e. Repair/replace lines and fittings as required f. Install in reverse order
32. REPLACE AIR COMPRESSOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Vent air system pressure c. Remove air compressor belt d. Remove front engine oil filter e. Remove connecting tubes f. Remove brace g. Remove air compressor and gasket h. Remove pulley i. Remove discharge housing and gasket j. Install in reverse order
33. REPLACE AIR COMPRESSOR DRIVE BELT	<ul style="list-style-type: none"> a. Remove fan belts b. Loosen capscrews in pulley c. Turn adjusting flange to left d. Remove drive belt e. Install in reverse order f. Adjust drive belt tension
34. REPLACE/REPACK WHEEL BEARINGS AND OUTER SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wheel c. Remove flange and gasket d. Remove bearing cone e. Remove hub and drum f. Remove bearing from hub spindle g. Remove seal h. Remove cups i. Grease bearing cone j. Install in reverse order
35. REPLACE INNER AXLE SEALS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block rear wheels c. Remove wheel d. Remove brake hub and drum e. Drain brake fluid from brake assembly f. Remove brake plate assembly nuts

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> g. Remove dirt deflector h. Remove brake plate assembly i. Remove spindle and thrust washer from outer shaft j. Pull out axle shaft assembly k. Remove inner shaft thrust washer l. Remove seal assembly m. Install in reverse order n. Bleed brake system
36. REPLACE/REPAIR TIRES	<ul style="list-style-type: none"> a. Remove wheel b. Unscrew valve core c. Break bead from rim d. Remove retaining ring e. Remove tire from rim f. Patch tire and/or tube as required g. Install in reverse order
37. REPLACE/TIGHTEN LUG STUDS	<ul style="list-style-type: none"> a. Tighten/remove lug nuts b. Remove wheel c. Tighten/remove lug studs d. Install in reverse order
38. ADJUST STEERING GEAR	<ul style="list-style-type: none"> a. Disconnect drag link from pitman arm b. Loosen steering jacket bracket group c. Loosen backlash adjusting screw d. Check steering wheel for drag e. Remove housing upper cover shims as required f. Tighten jacket bracket clamp g. Turn steering wheel to midposition h. Adjust backlash i. Connect and adjust drag link
39. REPLACE PITMAN ARM	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove drag link end from pitman arm c. Remove pitman arm d. Install in reverse order

TASK	PERFORMANCE STEPS
40. REPLACE DRAG LINK COMPONENTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pins from ends of drag link c. Back out adjusting plugs d. Turn steering wheel to loosen stud bolts e. Remove drag link f. Install in reverse order g. Adjust drag link
41. REPLACE STEERING KNUCKLE BOOT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove bracket from boot guard c. Remove boot guard d. Remove clamps from boot e. Cut boot with knife f. Remove severed boot g. Install in reverse order h. Sew zipper closed i. Seal zipper and boot edges with cement
42. REPLACE SPRING SHACKLES AND BOLTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Block wheels c. Remove spring d. Remove shackle pin e. Remove shackle f. Install in reverse order
43. REPLACE WINDSHIELD WIPER MOTOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wiper arm c. Loosen hose clamp d. Remove wiper motor e. Install in reverse order
44. REPLACE WINDOWS, DOORS OR MIRRORS	<ul style="list-style-type: none"> a. Remove bolts/fittings/seals b. Remove part c. Install in reverse order
45. REPLACE OR REPAIR WINCH CABLES, SHEAR PIN, OR DRIVE SHAFT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove shear pin c. Remove propeller shaft d. Unwind winch cable to end e. Pull out and remove cable f. Remove clevis g. Repair/replace cable as required h. Install in reverse order

TASK	PERFORMANCE STEPS
46. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages - Tightening bolts and/or connections - Replacing minor components such as fuses or fluids

PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63B/N/S/T **FOR: TRUCK, 1½ TON, M561/792**

TASK	PERFORMANCE STEPS
1. REPLACE OIL FILTER ELEMENT	<ul style="list-style-type: none"> a. Open and secure engine cover b. Remove air cleaner c. Drain oil from filter d. Remove oil filter and discard element e. Remove gasket from cover f. Remove center stud, spring, retainer washer, and retainer gasket from filter g. Clean with solvent and dry with air or cloth h. Install reversing procedures i. Add OE engine oil and replace oil from filter j. Start engine and check for leaks k. Close and secure engine cover
2. REPLACE AIR BOX DRAIN TUBE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure engine cover c. Remove drain tube d. Disconnect brake air tube e. Remove tee fitting from engine block f. Service air box drain tube g. Attach tee fitting to engine block h. Insert and secure drain tube i. Attach brake air tube to tee fitting and secure j. Start and operate engine k. Check drain tube for discharge of air l. Stop engine m. Close and secure engine cover
3. ADJUST ACCELERATOR LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen clamp at front of transmission c. Position throttle control arm d. Position cable in clamp e. Tighten clamp
4. ADJUST ENGINE STOP CABLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen collar between engine stop lever and throttle spring bracket c. Loosen clamp securing engine stop cable to throttle spring bracket

TASK	PERFORMANCE STEPS
5. REPLACE AIR CLEANER ELEMENT	<ul style="list-style-type: none"> d. Position engine stop lever in run position e. Position cable until collar on end of cable is touching engine stop lever f. Position other collar until flush with engine stop lever g. Secure collar h. Remove all cable slack between engine stop lever and clamp i. Secure clamp
6. REPLACE EXHAUST GASKETS	<ul style="list-style-type: none"> a. Open and secure engine cover b. Remove air cleaner shell and element c. Remove filter element by loosening wing nut d. Insert filter in air cleaner shell and tighten wing nut e. Install air cleaner shell in element f. Close and secure engine cover
7. REPLACE MUFFLER AND/OR TAILPIPE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure engine cover c. Remove clamp securing header pipe to manifold d. Remove exhaust manifold and gasket e. Install in reverse order
8. ADJUST BELTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove muffler from inlet and outlet pipes as required c. Remove inlet tailpipe from outer tailpipe d. Remove outer tailpipe from hanger e. Install in reverse order
9. REPLACE BELTS	<ul style="list-style-type: none"> a. Open and secure engine cover b. Pry generator away from engine block c. Position straight edge on top of belts between fan and generator pulleys d. Tighten adjusting arm bolt

TASK	PERFORMANCE STEPS
10. REPLACE RADIATOR	<ul style="list-style-type: none"> e. Move generator toward engine f. Remove belts g. Install in reverse order h. Adjust belt tension <ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure engine cover c. Open hull access cover port d. Drain cooling system e. Disconnect radiator hoses f. Remove surge tank and hose g. Remove top radiator supports h. Remove baffle from radiator i. Remove radiator j. Remove shroud from radiator k. Remove bottom support and crossmember l. Install in reverse order m. Check for leaks
11. REPLACE STARTER MOTOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Open and secure engine cover c. Disconnect engine harness d. Remove engine oil dipstick and extension tube e. Disconnect three electrical leads f. Remove starter from flywheel housing g. Install in reverse order
12. REPAIR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables

TASK	PERFORMANCE STEPS
13. REPLACE BATTERIES, CABLES AND/OR CLAMPS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove battery cover c. Disconnect ground cable d. Disconnect positive cable e. Remove battery retainer bracket f. Remove cable lug from each cable g. Open and secure engine cover h. Compress and remove grommet from tractor wall i. Pull cable through j. Remove cables from their respective connections k. Install in reverse order
14. REPLACE LIGHTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove light assembly cover/retainer c. Remove defective light bulb d. Install new light bulb e. Test for proper operation f. Install light cover/retainer
15. REPLACE HORN ASSEMBLY	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect electrical connections c. Remove mounting screws from horn brush guard d. Remove horn e. Install in reverse order
16. ADJUST TRANSMISSION CONTROL AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect shift control rod from transmission control assembly lever c. Loosen jamnuts from clevises d. Disconnect selector rod from shift control assembly e. Loosen jamnuts from clevises f. Move remote control lever to neutral position g. Move manual control lever to vertical position h. Position selector rod to transmission control lever i. Adjust clevis until pin can be inserted freely

TASK	PERFORMANCE STEPS
	<ul style="list-style-type: none"> j. Secure pin with clip and tighten jamnuts to clevises k. Position shift control rod to transmission control assembly lever l. Adjust clevis until pin can be inserted freely m. Secure with washer and cotter pin and tighten jamnuts to clevises
17. REPLACE UNIVERSAL JOINT	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect shock absorber from upper suspension arm c. Compress shock absorber upward to provide accessibility d. Bend back bolt locking tabs e. Remove bolts f. Remove drive axle g. Remove retaining rings h. Press spider and bearing assembly from axle i. Install in reverse order j. Lubricate U-joints
18. ADJUST PARKING BRAKE HANDLE AND LINKAGE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Release brake and turn handle one-half turn clockwise c. Apply brake d. Repeat 1 and 2 above until firm pull is required to apply the brake e. Release brake and turn knob or handle counterclockwise until it stops f. Remove tractor seat and console g. Disconnect adjusting rod h. Lift up on adjusting rod until it just stops i. Aline holes in adjusting rod and brake lever j. Secure adjusting rod and brake lever k. Install seat and console
19. REPLACE MASTER CYLINDER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove master cylinder access panel c. Remove driver's seat d. Disconnect instrument panel from cowl

TASK	PERFORMANCE STEPS
20. ADJUST AND BLEED SERVICE BRAKES	<ul style="list-style-type: none"> e. Remove cover and siphon fluid f. Disconnect hydraulic lines g. Disconnect master cylinder from bracket h. Remove boot from end of cylinder i. Remove cylinder j. Install in reverse order k. Bleed brakes <ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove inspection plug from brake drum c. Place transmission and transfer in neutral d. Block wheels, raise vehicle until tires clear ground, and block axle e. Rotate wheel until inspection hole is alined with star wheel f. Insert adjusting tool and rotate star wheel until the wheel locks g. Turn star wheel six clicks in the opposite direction. Turn wheel forward and backward to insure it turns freely h. Remove master cylinder cover and check fluid i. Aline inspection plug with the wheel cylinder bleed screw j. Bleed brakes
21. REPLACE FRONT OR REAR STEERING GEAR BOX	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Aline front wheels and chalk steering wheel hub and column c. Remove access panel d. Remove pitman arm e. Remove front steering shaft universal joint f. Remove steering column universal joint g. Remove steering gear box h. Install in reverse order i. Check and perform wheel alignment as required j. Service steering gear box

TASK	PERFORMANCE STEPS
22. REPLACE TRACTOR AND CARRIER STEERING KNUCKLE	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Jack and block vehicle c. Remove tire and wheel assembly d. Disconnect hydraulic and air hoses from brake assembly spindle e. Install protective caps on open lines and ports f. Tape hoses aside g. Support brake assembly and remove nuts securing brake assembly spindle h. Remove nuts and lock plates securing drive axle shaft i. Remove brake assembly j. Remove tie rod end from steering knuckle k. Disconnect shock absorber l. Remove coil spring m. Remove steering knuckle n. Install in reverse order
23. REPLACE TRACTOR AND CARRIER TIE ROD ASSEMBLIES	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove cotter pin, washer, and nut securing tie rod ends c. Using removal tool separate tie rod end from steering knuckles d. Using removal tool separate tie rod from carrier intermediate rod or from tractor pitman or idler arms e. Check measurements between center of rod ends and adjust as required f. Secure inner rod end to pitman or idler arms g. Secure tie rod ends h. Check and perform wheel alignment as required
24. REPAIR TRACTOR FRONT TORQUE TUBE BEARING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove tube bearing c. Disassemble d. Clean, inspect, and repair e. Assemble and install in reverse order

TASK	PERFORMANCE STEPS
25. REPLACE TRACTOR FRONT AND CARRIER SHOCK ABSORBERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect lower end of shock absorber from lower suspension arm c. Remove shock absorbers d. Install in reverse order
26. REPLACE INNER AND OUTER CENTRAL AXLE SHOCK ABSORBERS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove shock absorber and bushing c. Install in reverse order d. Replace with new bushings
27. REPLACE STEERING WHEEL	<ul style="list-style-type: none"> a. Position wheels in straight ahead position b. Remove horn switch assembly c. Remove nut securing steering wheel to steering shaft d. Remove steering wheel e. Install in reverse order
28. REPLACE WINDSHIELD WIPER MOTOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove wiper arm and blade assembly c. Remove splined drive, nut, spares, and leather washer from shaft d. Remove nuts securing wiper motor to stabilize bracket e. Disconnect electrical connector f. Remove wiper motor g. Install in reverse order
29. REPLACE PERSONNEL HEATER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect electrical connectors c. Disconnect air outlet hose d. Disconnect exhaust pipe e. Remove assistant driver's seat pins f. Move seat forward g. Disconnect fuel line h. Remove seat assembly with heater attached i. Remove heater from bottom of seat assembly j. Install in reverse order

TASK	PERFORMANCE STEPS
30. REPLACE BILGE PUMP	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove hull bottom access panel c. Remove discharge hose d. Disconnect electrical connectors e. Remove screw and washer securing pump assembly to bracket f. Loosen pump assembly clamps g. Remove pump h. Remove clamps, nipple and bushing from pump i. Install in reverse order j. Check pump for proper operation
31. REPLACE WATERTIGHT SEALS	<ul style="list-style-type: none"> a. Open tailgate and secure with chain b. Remove seal and seal retainer c. Install in reverse order
32. ADJUST, TIGHTEN OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as:</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

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PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 63B/S FOR: TRUCK, 8 OR 10 TON M520, M559, M553 (GOER)

TASK	PERFORMANCE STEPS
1. REPLACE ALTERNATOR	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect wiring from alternator c. Remove drive belts d. Remove lower nut and rotate alternator down e. Remove mounting bolt f. Remove alternator g. Install in reverse order
2. REPLACE AND/OR ADJUST BELTS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Loosen locknut and other bolts as required c. Remove and replace belts as required d. Adjust belt tension as specified e. Tighten locknut and other bolts as required
3. REPLACE STARTER	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery terminal cables c. Disconnect wires to starter and solenoid d. Remove mounting nuts e. Remove starter f. Install in reverse order
4. REPAIR WIRING	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Disconnect battery ground cables and secure c. Loosen or remove clamps as required d. Disconnect connectors e. Strip wiring f. Splice wiring/replace contact g. Solder and/or tape as required h. Apply insulating compound i. Connect wiring and test for continuity j. Connect battery ground cables
5. SERVICE PRIMARY FUEL FILTER	<ul style="list-style-type: none"> a. Disconnect fuel supply line b. Disconnect filter case from cover c. Remove filter element and gasket d. Disassemble filter case components e. Clean filter case, components, and element

TASK	PERFORMANCE STEPS
6. REPLACE SECONDARY FUEL FILTER ELEMENT	<ul style="list-style-type: none"> f. Assemble with new gasket in reverse order g. Prime fuel system <ul style="list-style-type: none"> a. Disconnect fuel supply line b. Remove element from base c. Install in reverse order d. Prime fuel system
7. REPLACE KING PINS	<ul style="list-style-type: none"> a. Diagnose/verify fault b. Remove bolt, lockwasher, and retainer from pins c. Remove pins d. Install in reverse order
8. REPLACE/REPAIR HORN	<ul style="list-style-type: none"> a. Diagnose verify fault b. Drain air system c. Disconnect battery cables d. Disconnect air lines and electrical leads to horn e. Remove mounting hardware f. Remove horn g. Inspect and replace faulty components h. Install in reverse order
9. REPAIR HYDRAULIC SYSTEM	<p>Perform the following steps as required:</p> <ul style="list-style-type: none"> a. Drain and fill system with hydraulic oil b. Replenish system with hydraulic oil c. Tighten connections d. Replace lines e. Replace pump f. Replace check valve (M553 crane) g. Adjust winch brake h. Replace winch shear pin i. Troubleshoot electrical switches
10. ADJUST, TIGHTEN, OR REPLACE MINOR COMPONENTS	<p>Performance steps for this task consist of minor actions such as</p> <ul style="list-style-type: none"> - Adjusting or alining linkages or sight scales - Tightening bolts and/or connections - Replacing minor components such as light bulbs or lamps, fuses or fluids

PERFORMANCE STEPS - CORRECTIVE MAINTENANCE TASKS
BY MOS: 31V **FOR: COMMO EQUIP**

TASK	PERFORMANCE STEPS
1. TEST/REPLACE ANTENNA ELEMENT, AT-1095 OR AS-1730	<ul style="list-style-type: none"> a. Disconnect cable b. Inspect contacts c. Check for cracks d. Replace faulty element
2. TEST/REPLACE ANTENNA MATCHING UNIT, MX-6707	<ul style="list-style-type: none"> a. Run through frequency bands b. Check frequency matching c. Replace faulty unit
3. TEST/REPLACE RF CABLE, CG-1773	<ul style="list-style-type: none"> a. Check connections b. Check reflector power, using Test Set, AN/URM-182 c. Replace faulty cable
4. TEST/REPLACE CABLE, CX-4722/2723	<ul style="list-style-type: none"> a. Check connections b. Check operation with known good matching unit c. Replace faulty cable
5. TEST RECEIVER/TRANSMITTER, RT-246 OR 524	<ul style="list-style-type: none"> a. Connect Test Set, AN/URM-182 b. Conduct performance tests as specified in TM 11-5820-401-12, pp. 5-9/10, 12/13 c. Record faults for support maintenance
6. TEST RECEIVER, R-442	<ul style="list-style-type: none"> a. Check circuit breaker b. Check cable connections and antenna c. Check new squelch in on and off positions d. Check reception on different frequencies e. Check volume control f. Record faults for support maintenance
7. TEST/REPLACE AMPLIFIER, AM-2060	<ul style="list-style-type: none"> a. Check operation with known good matching unit b. Check operation with known good cable, CX-4722 c. Check speaker operation d. Check radio power e. Replace faulty amplifier

TASK	PERFORMANCE STEPS
8. TEST/REPLACE MOUNTING, MT-1029 OR 1898	a. Check radio operation b. Check power output on A and B pins, using Multimeter, AN/URM-105 c. Check link setting d. Replace faulty mounting
9. TEST/REPLACE AUDIO FREQUENCY AMPLIFIER, AM-1780	a. Check all cable connections b. Operate radio c. Check amplifier operation d. Replace faulty amplifier
10. TEST/REPLACE INTERCOM CONTROL SET, C-2296/7/8	a. Set squelch to new "off" b. Check intercom operation in all positions c. Replace faulty control set
11. TEST/REPLACE RADIO CONTROL SET, C-2299	a. Set "Retrans" switch to "off" b. Adjust volume c. Set radio transmitter in positions 1 and 2 d. Check radio operation e. Set "Retrans" switch to "on" f. Check operation using distant radio terminals g. Replace faulty set
12. TEST/REPLACE FREQUENCY SELECTOR CONTROL, C-2742	a. Check all cable connections b. Check radio operation from front panel c. Replace faulty control
13. TEST/REPLACE POWER CABLE, CX-4655 (VRC-64)	a. Check all cable connections b. Check operation with known good amplifier and radio c. Replace faulty cable
14. TEST/REPLACE SUPPRESSOR, MX-778A	a. Test for 24-volt power output, using Test Set, AN/URM-182 b. Replace faulty suppressor
15. TEST/REPAIR HELMET, CVC	a. Check wiring b. Check intercom operation c. Check radio keying d. Check for earphone sidetone e. Repair/replace faulty components

TASK	PERFORMANCE STEPS
16. TEST/REPAIR SWITCHBOARD, SB-22 OR SB-993	<ul style="list-style-type: none"> a. Check handset/headset operation b. Check OPR pack c. Check all line packs d. Check wiring e. Repair/replace faulty components
17. TEST/REPAIR TELEPHONE, TA-312 OR TA-1	<ul style="list-style-type: none"> a. Check handset for sidetone b. Check ringer output c. Check volume control d. Check handset cradle e. Repair/replace faulty components
18. TEST LOUDSPEAKER, LS-454	<ul style="list-style-type: none"> a. Check operation b. Check cable connections c. Record faults for support maintenance
19. TEST MICROPHONE OR HANDSET	<ul style="list-style-type: none"> a. Check radio keying b. Check cord c. Record faults for support maintenance
20. SERVICE WIRE, WD-1 AND/OR REEL, DR-8	<ul style="list-style-type: none"> a. Clean wire/reel b. Ring test wire for continuity c. Splice wire, as required